



Remedial Investigation / Feasibility Study (RI / FS)

Work Plan

Volume 1 of 2

**Falcon Refinery Superfund Site
Ingleside
San Patricio County, Texas
TXD 086 278 058**

Prepared for
National Oil Recovery Corporation
3717 Bowne Street
Flushing, New York 11354

August 24, 2007

Prepared by
Kleinfelder
3601 Manor Road
Austin, Texas 78723

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LIST OF ACRONYMS

AOC	Area of Concern
ADSM	Alternative Development and Screen Technical Memorandum
API	American Petroleum Institute
ARAR	Applicable or Relevant and Appropriate Requirements
AST	Above-ground Storage Tank
ASTM	American Society for Testing Materials
ATSDR	Agency for Toxic Substances and Disease Registry
AWQC	Ambient Water Quality Criteria
bbl	Barrels
bgs	Below ground surface
BERA	Baseline Ecological Risk Assessment
BHHRA	Baseline Human Health Risk Assessment
BS&W	Basic Sediment and Waste
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CBBF	Coastal Bend Bays Foundation
CDI	Chronic Daily Intake
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CID	Criminal Investigation Division
CIP	Community Involvement Plan
COC	Chemical or Compound or Contaminant of Concern
COPC	Chemical or Compound or Contaminant of Potential Concern
COPEC	Chemical of Potential Ecological Concern
CRQL	Contract Required Quantitation Limits
CR	Cancer Risk
CSF	Cancer Slope Factor
CSM	Conceptual Site Model
CTTM	Candidate Technologies Technical Memorandum
DQO	Data Quality Objectives
EC	Exposure Concentration
EDI	Estimated Daily Intake
ELCR	Excess Lifetime Cancer Risk
EPA	United States Environmental Protection Agency
EPC	Exposure Point Concentration
FDEP	Florida Department of Environmental Protection
FETAX	Frog Embryo Teratogenesis Assay-Xenopus
FI	Fraction ingested
FS	Feasibility Study
FSP	Field Sampling Plan
FRC	Falcon Refining Company
GCC	Gulf Conservation Corporation
HEAST	Health Effects Assessment Summary Tables
HI	Hazard Index
HQ	Hazard Quotient
HRS	Hazard Ranking System Documentation Record, Falcon Refinery
HSDB	Hazardous Substance Data Bank

HSP	Health and Safety Plan
IR	Ingestion Rate
IRIS	Integrated Risk Information System
LD ₅₀	Median Lethal Dose
LOAEL	Lowest Observed Adverse Effects Level
LPST	Leaking Petroleum Storage Tank
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MRL	Minimal Risk Level
NCAM	Nine Criteria Analysis Memorandum
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAA	National Oceanic Atmospheric Administration
NOAEL	No Observable Adverse Effects Level
NORCO	National Oil Recovery Corporation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
O&M	Operations and Maintenance
OMOE	Ontario Ministry of Environment
OMS	Odorless Mineral Spirits
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
OU	Operating Units
PAH	Polycyclic Aromatic Hydrocarbons
PC	Project Coordinator
PCB	Polychlorinated biphenyl
PCL	Protective Concentration Level
PF	Problem Formulation
PPE	Probable Point of Entry
ppm	parts per million
PPRTV	Peer Reviewed Toxicity Values
PRG	Preliminary Remedial Goal
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RA	Removal Action
RACA	Remedial Alternatives Comparative Analysis
RAGS	Risk Assessment Guidance for Superfund
RAIS	Risk Assessment Information System
RI/FS	Remedial Investigation / Feasibility Study
RCRA	Resource Conservation and Recovery Act
RfC	Reference Concentration
RfD	Reference Dose
RME	Reasonable Maximum Exposure
RPM	Remedial Project Manager
RRC	Railroad Commission of Texas
RTECS	Registry of Toxic Effects of Chemical Substances
SAP	Sampling and Analysis Plan

SL	Soil Screening Level
SLERA	Screening-Level Ecological Risk Assessment
SOW	Scope of Work
STSC	Superfund Health Risk Technical Support Center
TA	Technical Advisor
TACB	Texas Air Control Board
TAG	Technical Assistance Grant
TCEQ	Texas Commission on Environmental Quality
TCLP	Toxicity Characteristic Leaching Procedure
TDWR	Texas Department of Water Resources
T&E	Threatened and Endangered
TIC	Tentatively Identified Compound
TL	Target Level
TNRCC	Texas Natural Resource Conservation Commission
TPH	Total Petroleum Hydrocarbons
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TRV	Toxicity Reference Value
TS	Treatability Study
TWC	Texas Water Commission
UCL	Upper Confidence Limit
µg/kg	micrograms per kilogram
µg/l	micrograms per liter
USGS	United States Geological Survey
VCP	Voluntary Cleanup Program

1.0 INTRODUCTION

This Remedial Investigation/Feasibility Study (RI/FS) Work Plan will be directed by the *Administrative Order on Consent for Remedial Investigation and Feasibility Study, CERCLA Docket No 06-05-04*, (Order) between the United States Environmental Protection Agency (EPA) and National Oil Recovery Corporation (NORCO).

The objectives of the RI/FS are: (a) to determine the nature and extent of contamination and any threat to the public health, welfare, or the environment caused by the release or threatened release of hazardous substances, pollutants, or contaminants at or from the Site, by conducting a Remedial Investigation; (b) to determine whether Remedial Action is necessary by conducting a Baseline Risk Assessment; and (c) to evaluate alternatives for Remedial Action, if any, to prevent, mitigate or otherwise respond to or remedy any releases or threatened release of hazardous substances, pollutants, or contaminants at or from the Site or facility, by conducting a Feasibility Study.

The three governing documents provided for this phase of the RI/FS are the:

- RI/FS Work Plan;
- RI/FS Sampling and Analysis Plan; and
- RI/FS Health and Safety Plan.

These documents should be considered “living documents” and if it becomes necessary all three will be modified to address any change in conditions at the site.

The RI/FS Work Plan (Plan) provides a description of planned field activities that will be conducted during this initial characterization of the site, in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 (CERCLA, 42 U.S.C. §9601, *et seq.*) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

This Plan has been developed in accordance with the EPA’s “Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA” (RI/FS guidance) and the Order. Specifically, the Plan will present a statement of the problem(s) and potential problem(s) posed by the Site and the objectives of the RI/FS.

The RI/FS Sampling and Analysis Plan (SAP) consists of the Field Sampling Plan (FSP) and the Quality Assurance Project Plan (QAPP).

Included in the FSP are detailed sampling and data gathering methods that will be used to define the nature and extent of contamination and to develop the human and ecological risk assessments.

The QAPP describes the project objectives and organization, functional activities, and quality assurance and quality control (QA/QC) protocols. All sampling and laboratory analytical methods and procedures to be performed will conform to EPA direction, approval and guidance regarding sampling, quality assurance/quality control, data validation and chain of custody procedures. Analytical laboratories used for this project will be accredited under the National Environmental Laboratory Accreditation Program (NELAP) and will comply with appropriate EPA guidance.

The RI/FS Health and Safety Plan (HSP) has been prepared in accordance with Occupational Safety and Health Administration (OSHA) regulations and protocols. The HSP is designed to be used during this and future phases of work at the site as a guide to the safe handling of chemicals, selection of sampling equipment, selection of proper personal protection equipment, and emergency response procedures. The HSP is intended to provide guidance to both site workers and any potential visitors.

References in this report are either cited fully herein or were taken from the Hazard Ranking System Documentation Record, Falcon Refinery, which was prepared by the Texas Natural Resource Conservation Commission (TNRCC) for the EPA.

NORCO acknowledges that the EPA uses the term “Site”, which is not defined in CERCLA, in referring to a “release” or “facility” on the National Priorities List (NPL). However, for this Plan the term Site (uppercase “S”) or on-site will be used to describe property owned by NORCO including the North Site, South Site and the Barge Dock Facility. When referring to the overall area the term site (lowercase “s”) or off-site will be used. Also, “facility” will be used to describe property and equipment owned by NORCO or some other specified adjacent entity. NORCO recognizes that under CERCLA the terms facility and release are interchangeable.

2.0 2.0 SITE BACKGROUND AND SETTING

The Falcon Refinery (a.k.a. NORCO) Site consists of a refinery that operated intermittently and is currently inactive. When in operation the refinery had a capacity of 40,000 barrels (bbl) per day and the primary products consisted of naphtha, jet fuel, kerosene, diesel, and fuel oil.

The Site occupies approximately 104 acres in San Patricio County, Texas, and is located 1.7 miles southeast of State Highway 361 on FM 2725 at the north and south corners of FM 2725 and Bishop Road (Figure 1, Area Map). Other portions of the site include piping leading from the Site (North and South) to dock facilities at Redfish Bay, where crude oil and hydrocarbons were historically and are currently transferred between barges and storage tanks, where vinyl acetate was historically transferred and may be stored, and any other area where contamination attributed to the Site is now located.

2.1 Site History

The Site (Figure 2, Site Map and Figure 2a Pipeline Map) has been owned, leased and/or operated under several different companies. The Oil and Gas Company of Texas, Inc. originally owned the Site. A deed search revealed that the facility was leased to UNI Refining, Inc. from the UNI International Corporation and the UNI Pipeline, Inc. for seven years, 1979-1986. UNI Refining Co. obtained an air permit in 1979 and commenced construction of the facility in April 1980. In March 1981, UNI Oil, Inc., the parent corporation of UNI Refining Company and UNI Pipeline Company, was sold to new owners operating under the name of Texas Independent Oil Corporation. In late 1983 to early 1984, the refinery was sold and began to be operated under the name Mid Gulf Energy, Inc.

The Falcon Refining Company (FRC) purchased the Site from Texas Independent Refining facility in November 1985. In 1986, production at the refinery once again ceased, FRC declared bankruptcy and the facility came under the ownership of American Energy Leasing, Inc. In May 1990, Impexco of Texas, Inc. acquired the Site from American Energy Leasing, Inc.

NORCO gained title to the refinery in December 1990 from Impexco of Texas, Inc. In June 1991, NORCO acquired the dock facility from the Sun Operating Limited Partnership. In the mid-1990s, MJP Resources, Inc. began leasing/operating the tanks on the northwest corner of the FM 2725 and Bishop Road and at the dock facility. In 1998, Pi Energy Corporation acquired 2.5 acres of the dock facility from NORCO.

Currently, Superior Crude Gathering Inc. (Superior) is leasing several above-ground storage tanks (ASTs) at the refinery portion of the Site and the barge docking facility, for crude oil storage and transportation.

2.2 Site Characterization

The site is located near the city of Ingleside, in the San Antonio-Nueces Coastal Basin adjacent to Redfish Bay, which connects Corpus Christi Bay to the Gulf of Mexico. Surface water drainage from the Site enters the wetlands along the southeastern section of the abandoned refinery. The wetlands then connect to the Intracoastal Waterway and Redfish Bay. The Site is bordered by wetlands to the northeast and southeast, residential areas to the north and northwest, Plains Marketing (crude oil storage) to the north, and several construction companies and a waste oil recycler to the west.

2.2.1 Site Physical Characteristics

The Falcon Refinery occupied two separate parcels of land that were connected by pipelines. The refinery property is located south of the intersection of FM 2725 and Bishop Road and the storage and former truck racks are located north of the same intersection.

When operational the storage and truck rack property (North Site) had nine ASTs that ranged in size from 1,000 bbls (Tank 3) to 20,000 bbls (Tanks 8 and 9), three truck loading racks, associated piping and a transfer pump (Figure 3). At the time of the submission of this work plan, only Tank 2 and Tank 7 from the operational facility are still present on-site. Three small tanks have been placed at the North Site near the former truck racks since the facility was operational. The owner and contents of the nearly empty tanks are unknown.

There is also a half buried concrete tank on the North Site that does not appear on the Site plans. It appears that used motor oil was poured around this tank.

The main portion of the refinery (South Site) was located south of the intersection of FM 2725 and Bishop Road (Figure 4).

When operational the crude oil topping plant produced light naphtha, heavy naphtha, kerosene and diesel. Operational equipment at the Site includes a cooling tower, crude exchanger, steam generator, vacuum cooler, blending equipment, heat exchangers, charge pumps, residue pumps, slop pumps, condensate pumps, water circulating pumps, sulfuric acid injection pumps, cooling water pumps, a vacuum column, condensate separator, flame arrestor, chlorinator, steam exhaust, chemical feed system and an HVAC pressurizing system. Storage consisted predominantly of Tanks 10 through 31, which ranged in size from 5,000 bbls (Tanks 17-24) to 200,000 bbls (Tank 30). Two additional tanks N1 and N2 (Tanks 32 and 33 respectively, of the main processing area of the refinery [Figure 4]), were also used to store product, including CERCLA hazardous substances. In addition there is a large fire water tank near the main entrance to the facility.

Storm water and process water were sent to storage tanks that had American Petroleum Institute (API) separators that removed any residual oil and sent the oil to a slop tank. The water was treated by a dissolved air flotation chamber and then flowed into the aeration pond. Historically, sludge was then removed in the clarifier and it is believed that any effluent from the refinery's wastewater treatment system may have been discharged directly into the unpermitted wetland area immediately adjacent to the Site because the discharge pipeline may have never been constructed to the outfall discharge point.

2.2.1.1 Surface Features

The Site elevation is near sea level with a maximum of ten feet above sea level. The adjacent wetlands, geology, soil, groundwater, meteorology and human population are described in the following sections.

2.2.1.2 Geology

Surface deposits consist of Quaternary Alluvium, which is comprised of clay, silt and sand of varying grain size. Beneath the alluvium is the Pleistocene Aged Beaumont Clay, which is comprised of clay that is interbedded with medium to fine sand. Both formations typically yield small to moderate quantities of fresh to moderately saline water.

Texas Water Development Board (TWDB) Report 73, Groundwater Resources of Nueces and San Patricio Counties and Bureau of Economic Geology Maps were reviewed for descriptions of the shallow geology. Results of the reviews indicated that the character of the stratigraphy is heterogeneous and the correlation of individual beds is difficult even over short distances.

Boring logs from the adjacent Plains facility (Appendix A) indicate that the shallow geology at the site is predominantly sand to a depth of 12 feet below ground surface (bgs). Information on water well completion logs (Appendix B) in the area was too general to use in the interpretation of the geology.

Detailed cross-sections will be constructed of the shallow geology of the site after the drilling program of the RI.

2.2.1.3 Soil and the Vadose Zone

Fourteen monitor well borings (Appendix A) were reviewed from the Plains Marketing facility that adjoins the North Site to the northeast, north and northwest. The descriptions indicate that the shallow stratigraphy is predominantly silty sand with color variations including shades of gray and brown and zones of black organic material. Some of the borings encountered basal clay at depths ranging from 10 to 12 feet bgs.

During drilling for the borings groundwater was encountered at depths ranging from three to eight feet bgs.

2.2.1.4 Surface Water Hydrology

The Site is bordered by wetlands that are described as palustrine emergent areas and estuarine intertidal emergent areas that are regularly flooded (Ref.53, p.1) to the south, east and northeast. The wetlands, which drain from the Site to the northeast, eventually connect to Redfish Bay, Corpus Christi Bay, Aransas Bay and the Gulf of Mexico.

Located in the San Antonio-Nueces Coastal Basin, the Site lies approximately 5 feet above sea level and drains into the adjacent wetlands. The topography of the Site is gently sloping to the southeast as revealed by the Port Ingleside, Tex., United States Geological Survey (USGS) topographic map. Surface water drainage from the Site enters the wetlands along the southeastern section of the refinery.

A culvert connects the palustrine/estuarine wetlands to estuarine wetlands. An aerial photograph (Figure 5) shows the connection between the wetlands to the Intracoastal Waterway and Redfish Bay.

Hazardous substances from the Site possibly entered surface water by overland flow from the Site through sandy berms and the cracked foundation of the lined surface impoundment and by surface water runoff during rain events. Hazardous substances also possibly entered the

Intracoastal Waterway from the current and historical docking facility by overland flow and surface water runoff during rain events and through the culvert located north of the historical barge dock facility.

There are several reports that the Falcon Refinery had a permitted National Pollutant Discharge Elimination System (NPDES) discharge point at the southern end of Hwy 2725. An application for Permit number 02142 was last submitted to the EPA on March 10, 1993 by Monitor Environmental on behalf of NORCO. The permitted discharge point was in Corpus Christi Bay approximately four miles from the refinery.

Mr. Doug Standifer, a former consultant for the Falcon Refinery, indicated that he had authorized the submittal of a permit for an NPDES discharge permit. However, there are no records to indicate that wastewater effluent discharges occurred under the permit and that the permit was ever used. Additionally, there are no records to indicate that the discharge pipeline was ever connected to the outfall point at Corpus Christi Bay. It is believed that the wastewater treatment effluent may have been directly discharged into the unpermitted wetland area immediately adjacent to the Site.

2.2.1.5 Meteorology

Average annual rainfall at the site approximately is 35.0 inches per year and the 2-year maximum 24-hour rainfall is 4.5 inches. Based on the Federal Emergency Management Agency Flood Insurance Rate Map for San Patricio County, Texas, Panel 531 of 533, Map Revised: March 18, 1985, the Site is within a 100-year floodplain.

2.2.1.6 Human Population and Land Use

The Site is located approximately 2.5 miles from the city of Ingleside, which has a population of approximately 9,400 people. Land use adjacent to the Site is comprised of predominantly industrial facilities (Figure 6). However, there are residences immediately west (at the intersection of FM 2725 and Bishop Road) and north of the refinery Site along Thayer Road. Additional information associated with land use is provided in Sections 5.4 and 5.5.8.

A one-mile radius water well search was performed and the report is provided in Appendix B. Information obtained in the water well search, which included all wells registered with the Texas Department of Water Resources, indicated that there are two registered water wells on Thayer Road, which is adjacent to the refinery. In addition to the search for registered wells a door-to-door search (Figure 7) was conducted and two water wells were found on Bishop Road. State of Texas Water Well Reports indicate that the two registered water wells on Thayer Road are screened in sand at a depth of 40 to 45 feet below land surface.

The depth to groundwater beneath the Site has been estimated at 3 to 8 feet bgs. No permanent groundwater monitor wells have been installed at the Site. However, monitor wells at the adjacent Plains site encountered groundwater in that range. Provided in Appendix A are boring logs from Plains, which indicated that the shallow geology is predominantly sand.

In addition to the presence of hydrocarbons noted near the above-ground tanks at the Site, other potential sources of groundwater contamination include on-site and off-site pipelines, above-ground storage tanks, former drum storage areas, oil pits, and metal refuse areas. The RI will reveal if the basal clay is consistent across the Site.

Adjacent businesses include (Figure 6):

- Oceaneering Solus Schall
- Southern Steel & Supply
- MMR Constructors Inc.
- Backwood's Grill
- State Service Co. Inc. (SSCI)
- Raymond Dugat Co., L.C. (Ingleside Properties aka Dugat Docks)
- Offshore Specialty Fabricators, Inc. (Gulf Conservation Corporation (GCC))
- TJs Machine Shop
- Gulf Marine Fabricators (Aker Gulf Marine – Aransas Pass Yard)
- Fincantieri Marine Systems
- Moose Lodge 2063
- Coastal Tech Fiberglass
- Playtime Amusements
- AG Produce
- Southland Fab & Offshore Inc.
- Surface Technologies Corporation
- Boss Exploration & Prod.
- New Park Environmental Services
- Live Oak Materials Inc.
- Garrett Construction Co.
- Lawn & Garden Shop
- Dynamic Industries, Inc.
- Plains Marketing LP
- Alamo Concrete Products LTD
- Perry Construction Co. Inc.
- ACI Concrete Construction
- ACI Mini Storage
- Baker Manufacturing Corporation
- Backwoods
- IBC Petroleum/ Pi Energy

Provided in Appendix C are Annual Waste Summary forms for a few of the adjacent facilities. The comprehensive file that contains the waste summaries and regulatory inspections is comprised of thousands of pages. When the RI data are obtained the COPC will be evaluated and compared to the listed facilities.

2.2.1.7 Endangered and Threatened Species

The area in and around the refinery and the adjacent wetlands is a known habitat for Federal and State designated endangered or threatened species (Ref. 78, p. 1). An inquiry through the Texas Parks and Wildlife Department (TPWD) Biological and Conservation Data System and a site visit from Mr. Beau Hardegree of the TPWD Lower Coast Conservation Assessment Program indicated the following endangered and threatened species in the vicinity of the wetland areas adjacent to the site. Federal Listed Endangered and State Listed Endangered Species, Brown Pelican (*Pelecanus Occidentalis*); State Listed Threatened Species, Reddish Egret (*Egretta Rufescens*). In the Redfish Bay environment: Federal Listed Endangered Species, Brown Pelican (*Pelecanus Occidentalis*) and Kemp's Ridley sea turtle (*Lepidochelys Kempii*); Federal Listed Threatened Species, Green Sea Turtle (*Chelonia mydas*); State Listed Endangered Species, Brown Pelican (*Pelecanus Occidentalis*); State Listed Threatened Species, Reddish Egret (*Egretta Rufescens*) (Ref.78, p.1,2,4,7,8).

A Kleinfelder biologist conducted a preliminary two-day project site survey on May 31 and June 1 of 2006 to determine the presence of special-status plants and animals and their associated habitats. Based upon this two-day survey we identified potentially suitable habitat for three special-status species within the Redfish Bay system: White-faced Ibis (*Plegadis chihi*), Opossum Pipefish (*Microphis brachyurus*), and the West Indian Manatee (*Trichechus manatus*).

Although potentially suitable habitat for these special-status species occurs on and adjacent to the project site, this habitat does not guarantee the presence of or optimum use by special-status species. Additional species-specific focused surveys will be needed to ascertain these data.

Both federally listed and state listed species shall be addressed in the ecological risk assessment (ERA). In order to eliminate a threatened/endangered species as being potentially present, an ERA will provide supporting documentation from a wildlife management agency to confirm the absence of the protected species on the affected property. If this is not possible due to the time constraints associated with the project, a discussion will be provided on the lack of suitable habitat by comparing the available habitat with the habitat needs of threatened/endangered species that could possibly occur in the county. It will not be enough to simply assume that no protected species are known to occur at the Site.

If the presence or absence of a protected species cannot be determined, then the species will be considered as being present and potentially impacted. For species known to use the area or suspected to use the area due to habitat suitability, the ERA must then demonstrate through exposure or action level determination that the species will either not be impacted, or that protective cleanup levels will be developed. These demonstrations are usually accomplished by

calculating the exposure and evaluating the risk to a receptor that is a surrogate (a receptor from the same feeding guild) for the protected species. In this case, the ERA should also explain why the particular receptor chosen is a suitable surrogate for the sensitive species. Finally, where a protected species is known to occur or could possibly occur at the Site based on habitat suitability, any cleanup levels should be based on the NOAEL toxicity reference value (TRV).

The dominant plant species and ecological communities were observed on and adjacent to the project site and all observed fauna was recorded and listed in the following. Although plant species composition, density and percent cover vary throughout the project area, the on-site wetlands exist within areas that would commonly be referred to as coastal salt marshes or mudflats with moderate to low salinity levels. These plants do not fall into a precise plant community taxonomic structure but they can be closely associated with the Saltgrass-Cordgrass, Coastal Live Oak-Redbay, and Little Bluestem-Brownseed Paspalum plant community series, as described by Diamond (1993).

Once the Phase I data are evaluated, a site-specific habitat food web appropriate for the site will be finalized and presented in the ERA. Phases I and II of the RI/FS are discussed in more detail in this Work Plan and in the Field Sampling Plan and Quality Assurance Plan. As the media investigation progresses and RI/FS field activities occur, more information may become available regarding additional wildlife present at the site.

2.2.2 Definition of Sources of Contamination

The following section describes releases based on the medium of impact. The extent of any of the following releases has not been determined.

Detailed documentation of site-related hazardous substance contaminant releases to the environment is publicly available at the local repository:

Ingleside Public Library
2775 Waco Street
PO Drawer 400
Ingleside, Texas 78361

The following references from the HRS contain documentation related to this topic:

- Reference 9 (Texas Water Commission Solid Waste Compliance Monitoring Inspection Report, 6/05/86);
- Reference 10 (EPA Potential Hazardous Waste Site, Site Inspection Report, 12/14/87) proposes a sampling location in a nearby residential area located immediately northeast of the refinery;
- Reference 25 (Letter from TNRCC to NORCO; 2/23/96);

- Reference 30 (Memorandum from EPA's Region 6 Lab to the Office of Criminal Investigation, 3/27/96) provides the analytical results of the samples taken from Tanks N1 and N2 on February 15, 1996;
- Reference 33 (TNRCC, Oil or Hazardous Substances Discharge or Spill or Air Release Report; 11/15/95 [reported], 11/16/95 [date of report]) is a report documenting a 11/15/95 spill from a pipeline, operated by MJP Resources Inc., approximately one mile south southeast of FM 2725 on Bishop Road and adjacent to the Brown and Root Facility in a wetland area;
- Reference 34 (Telephone Memo to the File, From TNRCC to the Texas Railroad Commission [RRC]; 2/23/96) provides notification to the RRC that the spill that occurred from the MJP Resources pipeline (Reference 33) is under the jurisdiction of the TNRCC, based on analyses of the samples collected at the spill site;
- Reference 35 (Letter from TNRCC to MJP Resources Inc., 3/01/96);
- Reference 45 (Interoffice Memorandum, Texas Department of Water Resources, Reference a Temporary Pond to Store Treated Effluent [Permit 02142], 7/02/79);
- Reference 46 (Investigation Form, Texas Air Control Board, 4/23/87); and
- Reference 58 (Interoffice Memorandum, Texas Water Commission, 1/14/86).

The following alphabetical references are not from the HRS, they were provided by the EPA and are located in the repository:

- Reference A (Texas Parks and Wildlife Department; Fish Kill/Pollution Complaint Detailed Report; Start Date, 11/14/95) describes a pipeline spill by MJP Resources;
- Reference B (Texas Parks and Wildlife Department; Fish Kill/Pollution Complaint Detailed Report; Start Date, 04/16/02) describes a pipeline spill on land adjacent to a wetland;
- Reference C (Railroad Commission of Texas, Inspection Report, Initial Report dated 4/05/02) consists of several reports concerning the spill described in References B, D (TCEQ; Notice of Referral for the Hydrocarbon Release at Offshore Specialty Fabricators; 802 Sunray Road, Ingleside [San Patricio County], Texas; 9/09/02), and E (Photos Taken by the U.S. Fish and Wildlife Service on 9/18/02);
- Reference D (TCEQ; Notice of Referral for the Hydrocarbon Release at Offshore Specialty Fabricators; 802 Sunray Road, Ingleside [San Patricio County], Texas; 9/09/02);
- Reference E (Photograph Taken by the U.S. Fish and Wildlife Service on 9/18/02) provides a photograph of the spill area discussed in References B, C, and D;
- Reference F (Texas Parks and Wildlife Department; Fish Kill/Pollution Complaint Detailed Report; Start Date, 09/20/02) describes an oil spill from a storage tank (Tank #7, North Site);

- Reference G (TNRCC, Oil and Hazardous Substances Spill or Discharge Report, 9/20/02) consists of various reports and photographs of the tank leak described in Reference F;
- Reference H (Photograph Taken by TCEQ on 7/07/04) provides a photograph of Tank #27; and
- Reference I (Monthly Report of the EPA's Activities Concerning the CIP [Community involvement Plan], 10/19/04) provides the EPA's monthly report of CIP-related activities.

2.2.3 Nature and Extent of Contamination

Spills and releases at the site are discussed based on the medium of impact however in this section releases are described that impacted multiple mediums or involved hazardous substance sampling from tanks and Site investigations.

On January 13, 1987, the Texas Air Control Board (TACB) took a sample from a wastewater storage tank at Falcon Refining. Records indicate that the refinery received 104,000 bbls of material from Tenneco in January 1986. A substantial amount of this waste remained in the pipelines and tanks. TACB officials noted that noxious odor complaints from surrounding residents began when the refinery started processing this material. TACB concluded that the Tenneco material was not virgin petroleum, but a mixture of organic solvents and, probably, waste. TACB analytical results from a sample of material taken from a tank on January 13, 1987, support the conclusion that this material contained constituents not normally occurring in crude oil. Butanol, cyclohexanediol, 1 phenylethanol, N,N-diphenylamine, and xylene were detected in the sample of wastewater from the refinery.

The EPA Criminal Investigation Division (CID) of the Houston Area Office conducted a criminal investigation from January 1996, until August 2000, on the activities at GCC, a facility located north of the NORCO dock facility, which was being operated by MJP Resources, Inc. Specifically the investigation concerned a vinyl acetate slop stream delivered to GCC. According to Mr. Ronald Cady, Louisiana Department of Environmental Quality Regional Hazardous Waste Coordinator, and Mr. Brian Lynch, CID, this stream consisted of odorless mineral spirits (OMS) that were used as a carrier for the reactant in the production of polyethylene at Westlake Polymers in Sulphur, Louisiana. In this process, the mineral spirits are recycled until they become too contaminated to use and would be classed as a spent solvent. Westlake Polymers segregates the two streams and labels them V-240 (OMS) and V-242 (OMS with VA). In the past, they had been classifying the mineral spirits as a co-product. The vinyl acetate is not an excluded substance under the petroleum exclusion.

Samples were collected by the CID in February 1996 at the Site from two tanks (N1 and N2), also referred to as Tanks 32 and 33 in the main processing area of the NORCO facility. The liquid samples collected revealed high concentrations of vinyl acetate in these two tanks; 1,360,000 micrograms per liter (ug/L) and 36,600,000 ug/L.

Trucks delivered the liquid described in the previous paragraph from GCC to the Falcon Refinery pursuant to permission given by the MJP Resources, Inc. President, a previous lessee of the Falcon Refinery.

The hazardous substances identified on-site included such chemicals as nitric acid, acetic acid, cupric chloride, potassium chromate, silver nitrate and potassium hydroxide. Additionally, the EPA believes that hazardous wastes and residues identified by the RCRA waste numbers D002, K049 and K051 are also present. All of the hazardous wastes and substances are "hazardous substances" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), and CFR § 302.4.

2.2.3.1 Groundwater

Review of the project files indicates that only one groundwater sample has been obtained at the Site and that sample was taken immediately below the area of a spill from an above-ground storage tank (Reference 38).

Laboratory analyses received by the TNRCC Region 14 Office on February 25, 2000 revealed the following constituents; 1,2 dichloroethane, 4-methyl-2-pentanone (Ref. 38, p. 180), benzene, ethyl benzene, m,p,o-xylenes, styrene, and toluene (Ref. 38, pp. 44-50). The analyses also revealed that the fluid sample exceeded the maximum concentration of benzene for toxicity characteristic using the Toxicity Characteristic Leaching Procedure (TCLP).

The lone sample was obtained from a temporary monitor well and there are no boring logs or completion logs are available.

The existence of water wells adjacent to the Site is discussed in Sections 2.2.1.6 and 5.5.9.2 of this report.

The condition of the groundwater at the site will be determined during the RI/FS.

Adjacent to the northern property boundary of the storage and truck loading property, the Plains Marketing (Plains) site is in the Texas Commission on Environmental Quality (TCEQ) Voluntary Cleanup Program (VCP).

Three monitor wells (MW-1, MW-2 and MW-3) are installed immediately adjacent to North Site property fence (Appendix D). Review of the project file indicates the all three of these wells were impacted with hydrocarbons in 1995. However, this portion of the site has been excluded from the VCP program and these wells have not been sampled since they initially reported concentrations that indicated impacts.

Conversations with the TCEQ during June 2006 indicate that portions of the Plains site have should have been in corrective action and that additional sampling will be required of Plains. The data when available will be used in the RI.

A copy of the “Third Quarter 2005 Groundwater Monitoring Report, Plains Marketing Terminal, Ingleside, Texas, VCP No. 449”, which was submitted to the TCEQ is included in Appendix E. The report includes analytical data summaries for the 19 monitor wells that are in the VCP program. Missing from the analytical summaries are data for monitor wells MW-1, MW-2 and MW-3, the monitor wells that were installed immediately adjacent to the North Site and had documented contamination in 1995.

2.2.3.2 Soil

This section includes in chronological order a description of the documented spills, discharges or the disposal of product or waste to the soil at the site.

On February 14, 1979, the TACB performed an inspection of the UNI Refinery in response to complaints of odors that were emanating from the facility. During the inspection two separate spills were noted and are depicted in Figure 8. The significant source of the odors was an accidental spill, which emanated from Tank 17, which stored slop oil. The spilled slop oil migrated to the east and entered the areas around Tanks 14, 13 and 12.

The second odor source from the 1979, TACB inspection was associated with open pit bottom sediments from Tank 15. Mr. Hodge, the Plant Manager, indicated that a shipment of crude oil from Nigeria was found to have an unexpected amount of bottom sediments and with no place to store the material the sediments were pumped into the diked area around Tank 15.

On June 17, 1979, Gene Hodge called the Texas Department of Water Resources (TDWR) to inform them that during the construction of a permitted temporary pond (Permit 02142), which was to be used to store treated effluent, oily ground was uncovered. The Site (Figure 9) and oily ground was inspected and photographed by the TDWR. Based on the record, the source of the oil was from a previous owner of the property that had probably disposed of basic sediment and waste (BS&W) and oily waste.

The refinery, when active processed material that consisted of not only crude oil but also contained hazardous substances, as defined by 40 CFR Part 261.32. In a Notification of Hazardous Waste Activity, signed on October 20, 1980 by Mr. Eugene W. Hodge (Vice President of UNI Refining, Inc.), four hazardous wastes from specific sources were listed: K048 (dissolved air flotation float), K049 (slop oil emulsion solids), K050 (heat exchanger bundle cleaning sludge), and K051 (API separator sludge). Of these sources, the listed hazardous waste K051, API separator sludge from the petroleum refining industry based on the toxicity of the sludge, was documented in an inspection report to have been deposited inside the walls of a tank berm. Other hazardous substances at the site included: vinyl acetate detected inside tanks during an EPA CID criminal investigation and a TNRCC Region 14 sampling event, chromium detected in deposited cooling tower sludges and untreated wastewater releases inside tank berms.

On January 9, 1982, during an annual solid waste compliance inspection by the TDWR, under Solid Waste Registration 31288, small quantities of separator sludge had been put in a “waste pile” on the northwest side of the berm for Tank 30 (Figure 10). After being informed of the violation, the record indicates that UNI would remove the small amount deposited and ship all API sludges off-site in the future. There is a letter from the TDWR indicating that in fact the sludge had been shipped off-site to Chemical Waste Management in Port Arthur, Texas.

During December 1985 a 100,000-bbl run of slop oil was received at the refinery. At the time the refinery’s wastewater treatment system was inoperable and the untreated wastewater was stored in tanks and ultimately discharged into sandy unlined containment structures (firewalls). The location of the released wastewater was noticed during a solid waste compliance inspection by the Texas Water Commission (TWC) on March 12, 1986 (Figure 11).

On January 13, 1986, TACB took a sample from a wastewater storage tank at the Site. Records indicate that the refinery received 104,000 bbls of material from Tenneco in January 1986. A substantial amount of this waste remained in the pipelines and tanks. TACB officials noted that noxious odor complaints from surrounding residents began when the refinery started processing this material. TACB concluded that the Tenneco material was not virgin petroleum, but a mixture of organic solvents and, probably, waste. TACB analytical results from a sample of material taken from a tank on January 13, 1987, support the conclusion that this material contained constituents not normally occurring in crude oil. Butanol, cyclohexanediol, 1 phenylethanol, N,N-diphenylamine, and xylene were detected in the sample of wastewater from the refinery.

During the annual solid waste inspection, which was performed on March 12, 1986, the inspectors noted that there were approximately 30 drums located in various locations of the refinery. West of Tank 31 there was 21 drums with bullet holes and spilled material. However, only four appeared to contain material.

The March 12, 1986, inspection also revealed that the Falcon Refinery had disposed of cooling tower sludges on-site. These sludges were sampled and the laboratory reported Total Chromium of 8020 milligram per kilogram (mg/kg) and an EP Tox Chromium of 46 micrograms per kilogram (ug/kg). The inspector noted that, during December 1985, the Falcon Refinery made a 100,000 bbl run of slop oil, which generated a substantial amount of very odorous wastewater. The refinery’s wastewater treatment system was inoperable during this run. The refinery placed untreated wastewater in tankage and then, ultimately, discharged the untreated wastewater into sandy, unlined containment structures (firewalls). According to a 1986 inspection report, the untreated wastewater was discharged into the bermed areas around tanks 10, 11, 26, and 27. A sludge, which had been dumped inside the firewalls of tank 13, was observed and sampled during the inspection of July 1986, by TNRCC Region 14 staff. Constituents found in the sample included naphthalene, 2,4-dimethylphenol, acenaphthene, fluorene, phenanthrene, fluoranthene, pyrene, and chrysene.

During the same inspection a sample of the cooling tower sludge was obtained by the TWC and analyzed. The results indicated that the total chromium concentration was 8020 parts per million (ppm), which indicated that the sludge was non-hazardous. Oily sludge was also noted around Tank 13.

On April 9 and 10, 1987 the TACB investigated three odor complaints that were received concerning the Falcon Refinery. An on-site inspection revealed a black liquid substance beneath a pipe rack within the refinery. The liquid, which appeared to be a solvent with hydrocarbon/carbon or a crude oil with solvent intermixed, was leaking from the third pipeline from Bishop Road, which was a 10-inch pipeline that connects the tank farm in the refinery to a run-of-pipe from the docks. The final spill covered an area approximately 30 feet by 60 feet.

On April 17, 1987, the repair was made to the pipeline and on April 21, Bernie Duncan of ARM Refining indicated that they used a bulldozer to cover the area and eliminate odors. He indicated that he would watch the area to see if the product seeped to the surface.

On January 4, 2000, TNRCC Region 14 inspectors completed a compliance inspection pertaining to the air quality requirements for permitted tanks. These tanks are located on the northwest quadrant of the FM 2725 and Bishop Road and are authorized in three active TNRCC air permits. The naphtha stabilizer unit, located in the main processing area in the southeast quadrant of FM 2725 and Bishop Road, was observed to be leaking from a valve between the sight glass and the tank. This valve was approximately 20 feet high and the wind was blowing a shower of leaking fluid on to an area of soil and vegetation surrounding the tank. Two 8-ounce jars of sample were collected of the liquid as it leaked from the valve. Based upon the flow rate of the leak observed on January 7, 2000, and the site inspections conducted on January 4, 6, 7, 10, and 11, 2000, it was determined by the TNRCC Region Office that a total volume of at least 220 gallons of material had leaked from the tank.

On September 20, 2002, after a heavy rain, Tank 7 from the North Site overflowed and somewhere between 500 gallons and 500 bbls of crude oil (the document record includes both amounts) was estimated to have been spilled. The crude oil filled the bermed area around the tank and spread to the east toward Hwy 2725. The spilled material got to the east side of Hwy 2725 and eventually flowed in the drainage ditch toward Bishop Road and then followed the drain ditch east along Bishop Road.

NORCO hired Miller Environmental (Miller) to respond to the release and Miller used vacuum trucks and absorbent pads to remove as much of the spilled material as possible. After the free liquid was removed, Miller excavated the impacted soil, sampled the area and replaced the soil. Sampling of the soil met TCEQ closure requirements. Reports describing the release are included in Appendix F.

Some of the crude oil that traveled along the drainage ditch on Bishop Road was deposited on Brenda Shedd's driveway on Thayer Road. Much of the impacted area has since been paved. During 2004, after heavy rain, Mr. Salinas on Bishop Road noted a sheen in the drainage ditch near their home.

Heavy rain also caused Tanks 26 and 27 at the refinery to overflow, spilling oily waste onto the ground. Since that time NORCO has been removing the contents of the tanks and they are both 80% empty at the time of the submission of this work plan and there is no chance that the tanks will overflow.

Results of the on-site sampling, which are reported in the HRS, revealed that the Site had five source areas and each will be discussed in the following paragraphs. The five source areas are considered part of the Operating Units (OU) of the refinery and are all within Area of Concern (AOC) 1.

Source Area 1 was sampled to evaluate the discharge of refinery process wastewater plus other refinery effluent streams and runoff to an outlet located in Corpus Christi Bay. Samples SO-18, SO-22 and SO-23, collected from Source Area 1, were analyzed for Volatile Organics, Semi-Volatile Organics, Metals/Cyanide and Pesticides/Polychlorinated biphenyls (PCBs).

Source Area 2 was sampled based on a note from the 1996, inspection that noted that there was an area designated in 1981, as "dumped benzene." No visual evidence of such an activity exists.

Source Area 3 was sampled to evaluate the main process area of the refinery and several known releases.

Source Area 4 was sampled to evaluate API separator sludge that was deposited inside the walls of a tank berm.

Source Area 5 was sampled to evaluate the dumping of cooling tower sludge on the ground.

Information on the soil samples, collected for purposes of the HRS, can be found in the HRS Documentation Record for the Site.

2.2.3.3 Surface Water

During an EPA inspection of the refinery on December 14, 1987, there is a note in the record that surface water samples were obtained from the lined lagoon, effluent from the process area drain system, water from southeast of the Site, background from Redfish Bay, and at a duplicate-appropriate location. There is a column for concentration and the result for all of the samples says "low". Actual laboratory analyses are not part of the record.

Surface water in the wetlands was impacted by a spill from an ARM Refining spill in 1985. The spill is discussed in the section 2.2.3.4.

2.2.3.4 Sediment

This section includes in chronological order a description of the documented spills that impacted the wetlands and sediment at the site.

During the inspection at the Plains Marketing (formerly ARM Refining) facility in December 1985, the TWC documented an oil spill from an ARM pipeline, which caused pollution to the surface waters of the State (Ref.58, pp. 2-3) (Figure 12). During this time, ARM's operations consisted of reclaiming waste oil from drilling site pond skim and used lubrication oil from various sources. The possible location of the spill was provided based on eye witness accounts and the current location of the Plains Marketing's pipeline which leads to their current docking facility.

Review of TCEQ files at the District Office in Corpus Christi and at central records in Austin did not reveal any information about cleanup activities associated with ARM spill in the wetlands.

On November 15, 1995, a spill was reported south-southeast of FM 2725 on Bishop Road, in the wetlands adjacent to the Brown & Root Facility (Figure 13). The spill occurred during a hydrostatic test of a pipeline prior to bringing the line back into service. The underground pipeline runs from the dock facility to the main facility. Approximately less than eight barrels of "crude oil" were spilled. According to Mr. Bernie Eickel of the Railroad Commission of Texas (RRC), the sample analyses on February 7, 1996, indicated the presence of substances other than crude oil. Two contaminated soil piles and two roll-off containers containing regulated waste associated with the spill resulted from the waste removal activity. Analyses of the February 7, 1996, samples (collected from one roll-off and liquid material leaking from the roll-off) indicated constituents not normally found in crude oil and elevated levels of the following constituents: tetrachloroethene, 2-methylnaphthalene, phenanthrene, toluene, and total xylenes.

On February 16 and 19, 1996, an inspection was conducted by the TNRCC Region 14 staff at the NORCO facility in response to an alleged crude oil pipeline spill from the facility on November 15, 1995. Analysis of the spilled residuals revealed constituents not naturally occurring in crude oil. Mercury, lead, 1,2, dichloroethane, benzene, ethyl benzene, styrene, toluene, total xylenes, chrysene, m-creosol, o-creosol, p-creosol, fluorene, methyl isobutyl ketone, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene, methyl tert-butyl ether, total organic halogens, and vinyl acetate were detected in the samples collected. Vinyl acetate was detected in tanks N1 and N2. Vinyl acetate is not an ingredient in crude oil nor does it substitute for other products, as it has no solvent properties, thus exempting the chemical from the petroleum exclusion.

On April 4, 1996, Jones & Neuse conducted grid sampling at the spill site (Figure 13 –MJP Pipeline Spill). The samples were analyzed for benzene, toluene, ethyl benzene, and xylene (BTEX) and total petroleum hydrocarbons (TPH). No BTEX content was detected in the soil samples taken, but TPH levels were detected ranging from 67 to 1930 mg/kg. The TNRCC limited sampling parameters to BTEX and TPH to obtain closure for the site. Closure was

ultimately granted based on no visible evidence of spilled material. Analyses for other hazardous substances, pollutants or contaminants were not performed even though other chemicals, not naturally occurring in crude oil, were spilled in the event.

On April 4, 2002, there was a spill of approximately 20 gallons of crude oil on property owned by Offshore Specialty Fabricators (Reference C on the CD provided by the EPA describing spills). The spill was in the wetlands north of Sunray Road (Figure 14). On July 29, 2002, the Texas Natural Resources Conservation Commission (TNRCC) issued a letter to Mr. Dickey Henderson (Offshore Specialty Fabricators, Inc.), which indicated that the apparent cause of the release is a series of abandoned pipelines on Offshore Specialty's property. A RRC report dated April 4, 2002, states that employees dug a hole approximately twelve (12) feet deep and found no clean sand. Samples of the liquids present at the spill, taken by the RRC on April 15, 2002, were analyzed and revealed the presence of vinyl acetate. A RRC report dated April 16, 2002, states that additional seepage was found from suspected unknown pipelines approximately 10 feet from the water of the salt marsh on the north end of Sunray Road. According to the RRC report, the lines were suspected to be UNI (a previous owner of the Falcon Refinery) lines.

Information on the sediment samples, collected for purposes of the HRS, can be found in the HRS Documentation Record for the Site.

2.2.3.5 Air

This section will describe air permitting, complaints dealing with the air, and inspections relative to emissions.

Review of project files provides the following information dealing with air, the TACB and TNRCC Office of Air Quality. The facility was constructed initially under TACB permit C-5243, which was assigned to the Oil and Gas Company of Texas, Inc. as a petroleum product storage facility. The facility was then sold to UNI Oil, Inc. and permit C-6879 was added for additional storage.

In 1977, UNI Oil, Inc then applied for a permit (C-6027) to construct a 10,000 bbl per day crude topping plant with associated tankage, truck loading and barge dock. Additional storage was then added under permit numbers C-6607 and C-6027. The TACB issued a letter dated June 13, 1978, that indicated that the construction that was being performed at the Site was a violation. On June 14, 1978, UNI Oil, Inc applied for the construction of an additional 30,000 bbl per day crude distillation unit.

While reviewing the application for the new unit, the TACB held a public meeting with area residents. During the meeting there were several complaints concerning UNI Oil, Inc's operations, however, the complaints, which dealt with the dust and speeding trucks, were out of the jurisdiction of the TACB.

A complaint was called in to the TACB on August 22, 1978, about odors at the Site. When the investigator arrived at the Site, the odors were no longer present and no contact was made with UNI Oil, Inc.

On February 14, 1979, a nearby resident complained about odors emanating from the UNI Oil facility. The odors were verified by a TACB inspector and Gene Hodge, the plant manager, indicated that the source of the odor was an accidental spill from slop tank No. 17. An additional odor was also detected during a follow up Site investigation and the source of that odor was an open pit of bottom sediments around tank No. 15. According to Mr. Hodge, a crude oil shipment from Nigeria was found to have an unexpected amount of bottom sediments. With no place to store the unusable material the bottom sediment was pumped into the diked reservoir.

On December 30, 1985, a resident complained that they had experienced odor problems off and on for the last week. An investigation was conducted the following day and a strong caustic/mercaptan odor was noted. The facility was now known as Falcon Refining. A Site inspection revealed that only one person, a consultant, was at the facility and he indicated that Falcon had refined some 7,000 bbls in check-out runs. The consultant was notified that the odors were a violation and that a notice would be issued.

On January 10, 1986, another complaint was received and investigated by the TACB. During the inspection a sweet, "varnish-type" odor was detected from several cone-roofed storage tanks located behind the office. Mr. Richey, the Plant Manager, indicated that the refinery had not run since the night/morning of January 7/8 and would not run until the issue of change in ownership was resolved. He also noted that the odor was from the storage of water that was produced during the refining run of the Tenneco feedstock. On the 13th a sample of the material was obtained and hand-carried to Austin on the 14th. During the sample collection, the odor was again noted.

Results of the sample indicated that presence of xylene, butanol, cyclohexanediol and 1 phenylethanol.

On April 9 and 10, 1987, the TACB investigated three odor complaints that were received concerning the Falcon Refinery. The investigators reported that a strong odor of phenol and/or oxygenated alcohol hydrocarbon or solvent were evident and that the vapors caused irritation of the nasal passages and mucous membranes. On-site inspection revealed a black liquid substance beneath a pipe rack within the refinery. The liquid, which appeared to be a hydrocarbon solvent or a crude oil with solvent intermixed, was leaking from a 10-inch pipeline that connects the tank farm in the refinery to a run-of-pipe from the docks.

On December 28, 1995, MJP Resources Inc. sent a letter to the TNRCC Office of Air Quality to modify the existing air permits. The plan called for the use of two existing 55,000 bbl internal floating roof tanks and two 20,000 bbl tanks to be used to store crude oil from barges.

2.2.4 Additional Site Characterization

The most significant immediate threat to the environment from the Site is the waste that is stored in the above-ground storage tanks, which will be a central focus of the Removal Action.

2.2.4.1 Potential Off-Site Sources

Plains Marketing lies adjacent to the northern section of the Falcon Refinery (Ref. 57, p. 3). This facility was a crude oil topping facility with a production capacity of 10,000 bbls per day and now operates as a petroleum storage and transfer terminal (Ref. 57, p. 6). During the inspection at the Plains Marketing (formerly ARM Refining) facility in December 1985, the TWC documented an oil spill from an ARM pipeline that caused pollution to the surface waters of the State (Ref. 58, pp.2-3). During this time, ARM's operations consisted of reclaiming waste oil from drilling site pond skim and used lubrication oil from various sources.

Much of the facility has been assessed and evaluated through the VCP under the TCEQ. The Plains site has 19 monitor wells, which have quarterly gauging and sampling data dating back to 1996 (Appendix E). September 2005 analytical data indicate that samples from monitor wells (MW-17) which formerly exceeded the drinking water standard for benzene, is located across FM 2725 from where the release occurred.

Monitor wells MW-1, MW-2, MW-3 and MW-4 (Appendix D), which are not included in the area that is defined by the VCP, are located immediately adjacent to the North Site. Review of the project file at the TCEQ indicates that these monitor wells were only sampled once in November, 1995 and that the analytical results for MW-1, MW-2 and MW-3 indicated that the groundwater was contaminated.

These monitor wells are immediately upgradient of the North Site and the possibility exists that the groundwater underlying the NORCO facility may have been impacted. This possibility will be investigated during the RI/FS planned for the site.

To the south of the Falcon Refinery, the Garrett Construction Company is located at Garrett Road and FM 2725 in Ingleside. A TNRCC file review revealed air permit exemptions regarding a sand and gravel screening plant, an outdoor dry abrasive blast facility, and a rock crusher unit it for this construction company (Ref. 60, p. 1-5).

Aker Gulf Marine - Aransas Pass Yard is located northeast of the Falcon Refinery (Figure 6). Aker Gulf Marine is a fabricator of offshore structures and other petroleum related structures for the oil and gas industry (Ref.61, p.5). The Aransas Pass Yard is the site where structural components are fabricated (Ref. 61, p. 6). This facility has a permitted discharge point into the Intracoastal Water/Redfish Bay under Texas Pollutant Discharge Elimination System (TPDES) permit (Ref. 62, p. 1).

IBC Petroleum and Pi Energy were located immediately northwest of the Dock Facility (PPE-2). Sample SO-05 (F02JJ/MF00P3) (Ref.42, pp.67-69; Ref.43, p.20) was taken northwest of the NORCO dock facility. The soil sample location was collected at the location of leaking equipment on the IBC Petroleum property. The constituents detected in that sample were not detected in the samples collected adjacent to the dock facility, SE-30 (F02JA/MF00NT) (Ref.21, pp. 9, 11, 12, 21; Ref. 16, pp. 9, 15, 25) and SE-31 (F02JB/MF00NW) (Ref. 21, pp. 9, 11, 12, 40-42, 73-78; Ref. 16, p. 9, 16, 26).

Alamo Concrete Products, LTD., (formerly Coast Materials, Inc.) is an inactive concrete batch plant located northeast of the NORCO dock facility and north of Sunray Road (Ref. 63, pp. 1-2; Ref. 64, p. 1). The type of air contaminants associated with Coast Materials, Inc. included fly ash, cement, cement and aggregate, and dust (Ref. 65, p. 1).

Brown & Root, Inc. was located off of Bay Avenue and Bishop Road (Figure 6) (Ref. 66, p. 1). There has been minor soil contamination resulting from a Leaking Petroleum Storage Tank (LPST). However, the case was closed by TNRCC (Ref. 67, p. 1). Brown & Root applied for an air permit relating to abrasive blast cleaning in May 14, 1985 (Ref. 68, p.1). No wastewater discharge permit was located for this facility.

Ingleside Properties, Inc. a.k.a. Dugat Docks is a facility located at the end of Bishop Road and the North Bank Terminal on the Intracoastal Waterway / Redfish Bay. The operation described in the permit application is as a drilling fluids chemicals terminal and oil field waste treatment plant (Ref. 69, p. 1).

GCC was located on the Intracoastal Waterway / Redfish Bay north of the NORCO/MJP Resources, Inc., dock facility and south of Aker Gulf Marine (Figure 6). The site is now owned by Offshore Specialty Fabricators. On December 2, 1995, a spill occurred of approximately 170 gallons of unknown petroleum hydrocarbon at the GCC (Ref. 72, p. 1). The report states that there was not any receiving water for the spill. Acetone, chloromethane, and methyl ethyl ketone (2-butanone) were detected in a soil sample collected on September 18, 1996 (Ref. 71, pp 3-6). The contaminated soil was removed from the site (Ref. 70, pp. 1-2).

On January 4, 1996 TNRCC staff went to the GCC site and sampled the ASTs. Results of the analyses indicated that vinyl acetate was detected in the storage tanks.

3.0 INITIAL EVALUATION

Conceptual Site Models (CSMs) for human and ecological receptors have been developed; these are based on the results of preliminary site investigations and other data. Both are summarized in the CSM Flowchart for Human & Ecological Receptors (Figure 15), which shows potential exposure and migration pathways and receptor scenarios to be considered in developing human health and ecological risk evaluations for site contaminants under existing and future conditions. The CSM Schematic for Human Receptors (Figure 16a) and the CSM Schematic for Ecological Receptors (Figure 16b) depict the general features of these exposure scenarios in a non-technical manner

designed to be readily comprehended by any viewer. The CSMs, the CSM Flowchart, and the CSM Schematics will be refined as necessary during implementation of the Data Quality Objectives (DQO) Process.

3.1 Types and Volumes of Waste

Waste at the Site consists of liquid and sludge in the above-ground storage tanks, piping and abandoned sumps, material left in drums that were abandoned at several locations at the site and impacted soil.

During September 2004 there were approximately 50 abandoned drums at the site. Since that time all drums were properly sampled, characterized and disposed.

3.1.1 Type of Waste

Previous analytical sampling of the above-ground storage tanks (at NORCO and adjacent facilities), soil sampling, sediment sampling, surface water sampling and groundwater sampling have identified the constituents listed in Section 3.3.

3.1.2 Volume of Waste

All of the above-ground storage tanks were examined and the contents of the tanks sampled during August and September 2004. The results indicated that approximately 6.9 million gallons of hazardous waste was in the tanks. As of April 2007 NORCO had disposed of approximately 6.05 million gallons of the waste leaving approximately 850,000 gallons in the above-ground storage tanks.

NORCO continues to remove and dispose of this hazardous waste and plans to dispose of all hazardous waste in these tanks by December 2007.

3.1.3 Pipeline Abandonment

Residual liquids in on-site above-ground piping have been removed as well as a portion of the liquids in the abandoned underground pipelines that connect the refinery to the former and current barge dock facilities. Disposal activities associated with the RA are described on a monthly basis in the Monthly Progress Reports.

On August 6, 2007, Addendum No. 2 of the Removal Action Work Plan (Appendix G) was prepared and submitted into the document record. The report, which describes the abandonment of ten pipelines associated with the refinery, is summarized in the following paragraphs.

Ten of the service pipelines were cut and capped at the point where they travel underground, close to the intersection of Bishop Road and Bay Avenue. Near the intersection of Sunray Road and Bay Avenue the ten pipelines were twice cut again and a section was removed from each.

After the pipelines were either pigged clean or vacuumed to remove all contents, they were capped with welded-on steel plates or by some other means. In total approximately 8,400 gallons of hydrocarbons and water were removed from the pipelines and placed in Tank 26 on the refinery property.

During May 2007 a second assessment will be performed to ensure that all liquids are removed from the pipeline segment that runs from Sunray Road to the former barge dock facility.

The area of the abandoned pipelines will be further evaluated during the RI/FS.

3.2 Potential Pathways of Contaminant Migration

As shown in the CSM Flowchart (Figure 15), the potential migration pathways for site contaminants include volatilization to outdoor air, leaching from soils to groundwater, generation of fugitive dusts in outdoor air, and storm-water runoff. The (BHHRA) Baseline Human Health Risk Assessment and the Ecological Risk Assessment will address the migration pathways described in the CSM Flowchart.

3.3 Potential Applicable or Relevant and Appropriate Requirements (ARARs)

CERCLA §121(d) specifies that on-site Superfund remedial actions must attain federal standards, requirements, criteria, limitations, or more stringent state standards determined to be legally applicable or relevant and appropriate to the circumstances at a given site. Such ARARs are identified during the remedial investigation/feasibility study (RI/FS) and at later stages during the remedy-selection process. For removal actions, ARARs are identified whenever practicable depending upon site circumstances. To be applicable, a state or federal requirement must directly and fully address the hazardous substance, the action being taken, and other circumstances pertinent to the site. A requirement which is not applicable may be relevant and appropriate if it addresses problems or pertains to circumstances similar to those encountered at a Superfund site.

Both chemical-specific and location-specific ARARs will be identified during the RI process and will be discussed with the project team during the Phase I scoping meeting after the Phase I data are gathered and the screening-level analysis is complete. Potential sources of chemical-specific ARARs include:

- Safe Drinking Water Act (42 U.S.C. 300(f)):
 - Maximum Contaminant Levels (MCLs) for chemicals, turbidity, and microbiological contamination; applicable to drinking water for human consumption (40 CFR 141.11-141.16).
 - Maximum Contaminant Level Goals (MCLGs) (40 CFR 141.50-141.51, 50 FR 46936).
- Clean Water Act (33 U.S.C. 1251) requirements established pursuant to sections 301 (effluent limitations), 302 (effluent limitations), 303 (water quality standards, including

State water quality standards), 304 (Federal water quality criteria), 306 (national performance standards), 307 (toxic and pretreatment standards, including federal pretreatment standards for discharge into publicly owned treatment works, and numeric standards for toxics), 402 (national pollutant discharge elimination system), 403 (ocean discharge criteria), and 404 (dredged or fill material) of the Clean Water Act, (33 CFR Parts 320-330, 40 CFR Parts 122, 123, 125, 131, 230, 231, 233, 400-469).

- Marine Protection, Research, and Sanctuaries Act (33 U.S.C. 1401).
- Toxic Substances Control Act (15 U.S.C. 2601).
- Resource Conservation and Recovery Act (40 CFR Parts 260-279).
- Applicable TCEQ guidelines, TRRP rules and any other standards specific to the state of Texas.

A preliminary list of potential location-specific ARARs is presented below in Table 3.3A.

Table 3.3A Potential Location-Specific ARARs

Location	Citation
Within 100-year floodplain	40 CFR 264.18(a)
Critical habitat upon which endangered species or threatened species depend	Endangered Species Act of 1973 (16 USC 1531 <u>et seq.</u>) 50 CFR Part 200, 50 CFR part 402 Fish and Wildlife Coordination Act (16 USC 661 <u>et seq.</u>)
Wetlands	Clean Water Act section 404; 40 CFR Parts 230, 33 CFR Parts 320-330.
Within coastal zone	Coastal Zone Management Act (16 USC 3501 <u>et seq.</u>)

Following is a preliminary list of the chemicals of potential concern (COPCs) that have been identified on or near the site and for which we expect to develop chemical-specific and location-specific ARARs. The chemicals are organized by chemical class into three categories: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. Maximum contaminant levels (MCLs) have been identified for the chemicals that are underlined and these values are provided in Appendix I.

- **VOCs:**
Benzene, Butanol, Cyclohexane, Cyclohexanediol, 1,2-Dichloroethane, Ethylbenzene, Ethyl ether, Hexane, Isopropylbenzene, Methyl ethyl ketone, Methyl isobutyl ketone, 4-methyl-2-pentanone, Methyl tert-butylether, N-diphenylamine, N-propylbenzene, 1-phenylethanol, Styrene, Tetrachloroethylene, Toluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, Vinyl acetate, and Xylenes.

- **SVOCs:**
Acenaphthene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Benzo(a)pyrene, Chrysene, 2,4-Dimethylphenol, Fluoranthene, Fluorene, Indeno(1,2,3-cd)-pyrene, 2-Methylnaphthalene, 2-Methylphenol, 3-Methylphenol, 4-Methylphenol, Naphthalene, Phenanthrene, and Pyrene.
- **Metals:**
Aluminum, Arsenic, Chromium, Copper, Lead, Manganese, Mercury, Nickel, Thallium, Vanadium, and Zinc.

4.0 WORK PLAN RATIONALE

Data collection, which is described in detail in the FSP, is designed to meet the objective of obtaining the required data to evaluate the human health and ecological risks associated with the site.

Due to the lack of 1) data concerning the current contents of the ASTs, 2) delineation of any of the spills or releases, 3) information concerning groundwater at the site and 4) information as to the variety of spilled compounds, the RI involves uniform analytical testing that is designed to identify any areas of specific concern.

5.0 RI/FS TASKS

5.1 Field Investigation

This is addressed in the RI/FS Sampling and Analysis Plan.

5.2 Sample Analysis / Validation

This is addressed in the RI/FS Sampling and Analysis Plan.

5.3 Data Evaluation

This is addressed in the RI/FS Sampling and Analysis Plan.

5.4 Community Relations

The EPA conducted door-to-door interviews with local residents living within one mile of the Site in October 2002 to gather information about the site. The EPA also met with the City Manager of Ingleside to discuss the status of the Site. On October 12, 2004 the EPA met with San Patricio County Commissioners and local residents living immediately adjacent to the Site to provide an update of site activities and to discuss concerns that were voiced during the community meeting held on September 16, 2004 at the Ingleside City Hall. Community involvement activities are described in the Community Involvement Plan (CIP), prepared by the

EPA for the site, which is updated on a regular basis. The CIP is located at the Ingleside Public Library.

To keep the public informed, NORCO and the EPA held a community meeting on September 16, 2004 to discuss current and planned activities for the site. A fact sheet announcing the meeting was mailed to over 250 individuals and entities. Newspaper announcements were “public noticed” in the Corpus Christi, Ingleside and Port Aransas newspapers, prior to the community meeting, which encouraged the public’s participation.

The following are notes from EPA interviews of residents on Thayer Road and Bishop Road.

On 10/12/04 at 3 pm the EPA met with Debbie Belt (113 Thayer Circle, Rt. 1 Box 481-I, Ingleside TX) to discuss her water well located immediately south of FM 2725. The EPA had interviewed her in late 2002. She informed them that she has not noticed any odor/contamination problems with the water from her well and stated that the water tastes good to her.

On 10/12/04 at 3:20 pm the EPA met with Brenda Shedd (Thayer Road). Her property is located immediately northeast adjacent to the refinery. She had previously filed several complaints with the State about the refinery activities. She stated that on one occasion an oily substance spilled onto her backyard from a leak at the refinery. On another occasion she stated that she observed refinery workers pumping liquids that had spilled onto the ground at the refinery into the wetland area to the northeast of the Site and behind her property. She stated that she had reported both incidents to the TNRCC and investigators had come to the site.

On 10/12/04 at 5 pm the EPA met with Brenda Carroll (1322 Sunray Road), upon her request by telephone to the EPA Community Involvement Coordinator, to discuss her water well. She stated that she no longer uses the well (they are on city water now) because of hydrocarbon odors. Her husband stated that they had it tested and the well water showed elevated levels of barium. This water well is located across Sunray Road from Plains oil storage facility, most probably upgradient of the Falcon Site. They were referred to the TCEQ.

The EPA awarded a Technical Assistance Grant (TAG) to the Coastal Bend Bays Foundation (CBBF) on December 14, 2004. Mrs. Lois C. Huff, the Executive Director for the CBBF, can be reached at (361) 882-3439 or at the internet address www.baysfoundation.org. The purpose of a TAG is for a local citizen’s group to secure the services of a technical advisor (TA) to increase citizen understanding of information that will be developed about the site during the Superfund process. The EPA and NORCO will work closely with the TA and will provide the necessary documentation for his/her review.

All project documents are publicly available at the local repository:

Ingleside Public Library

2775 Waco Street
PO Drawer 400
Ingleside, Texas 78361

5.5 Baseline Human Health Risk Assessment Work Plan

The BHHRA Plan provides an overview of the methods to be used in conducting the BHHRA for the Site located in Ingleside, San Patricio County, Texas. Further information on the site location and history is presented in Section 3.

5.5.1 General Site Description

The Site consists of an approximately 104-acre refinery that operated intermittently and is currently inactive. It is located near Ingleside, Texas in San Patricio County, Texas at the north and south corners of the intersection of FM 2725 and Bishop Road. When in operation, the refinery had a capacity of 40,000 bbls per day and the primary products consisted of naphtha, jet fuel, kerosene, diesel and fuel oil. Another portion of the site includes a dock facility on Redfish Bay, where materials were transferred between barges and storage tanks. The Site is bordered by wetlands to the east, northeast and southeast, residential areas to the north and southwest, and construction companies to the south and north.

5.5.2 BHHRA Objectives

The primary objective of the BHHRA is to evaluate and assess potential risks to human health posed by chemicals present on or originating from the Site, in the absence of any remedial action. The principal guidance documents that have been used to prepare the BHHRA plan are:

Risk Assessment Guidance for Superfund (RAGS) (Parts A, B, C, D, and E) (EPA 1989, 1991a, 1991b, 1998, and 2004).

Supplemental Guidance to RAGS: Standard Default Exposure Factors (EPA 1991c).

Exposure Factors Handbook (EPA 1997a).

Guidance for Data Usability in Risk Assessment, Office of Emergency and Remedial Response. OSWER Directive No. 9285.7-09A. April 1992 (and Memorandum from Henry L. Longest dated June 2, 1992) (EPA 1992).

EPA Region 6 Risk Assessment Guidance (EPA 1995).

EPA Region 6 Media Specific Screening Levels (EPA 2007).

TCEQ Regulatory Guidance: Determining PCLs for Surface Water and Sediment. RG-366/TRRP-24 (Revised) December 2002 (TCEQ 2002)

TCEQ Protective Concentration Levels (TCEQ 2007).

Additional EPA guidance documents will be used as necessary to supplement the principal guidance documents.

In accordance with EPA guidance, the four steps of a baseline risk assessment are:

- Data Collection and Evaluation – This step of the process involves gathering and analyzing the site data relevant to the human health evaluation and identifying the substances present at the site that are the focus of the risk assessment process.
- Exposure Assessment – An exposure assessment is conducted to estimate the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed.
- Toxicity Assessment – The toxicity assessment component of the baseline risk assessment considers: 1) the types of adverse health effects associated with exposures to the chemicals of potential concern; 2) the relationship between magnitude of exposure and adverse effects; and 3) related uncertainties such as the weight of evidence of a particular chemical's carcinogenicity in humans.
- Risk Characterization – The risk characterization summarizes and combines outputs of the exposure and toxicity assessments to characterize baseline risk, both in quantitative expressions and qualitative statements. During risk characterization, chemical-specific toxicity information is compared against both measured contaminant exposure levels and levels predicted through fate and transport modeling to determine whether current or future levels at or near the site are of potential concern.

Final Risk Assessment Reports will follow the approach described in the EPA's guidance document entitled "Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual [Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments], Interim, Publication 9285.7-01D, January 1998".

In accordance with the Order for the Site, a Draft BHHRA will be prepared and submitted to EPA for review and approval according to the schedule specified in the Final RI/FS Work Plan. An Amended Draft BHHRA Report will be submitted 45 calendar days after the receipt of the EPA's comments on the Draft BHHRA Report. A final BHHRA will be submitted within 30 calendar days after the receipt of EPA's approval of the Amended Draft BHHRA.

5.5.3 Data Evaluation

The BHHRA will be based on all available site data. All historical information on the hazardous substances present in and around the site as provided in the documents referenced in Section 2 of this RI/FS Work Plan will be reviewed. In addition, results of sampling that will be conducted as part of the additional site activities proposed in this RI/FS Work Plan will be included in the data evaluation.

All sampling locations and associated data that will be used for the exposure scenarios to be evaluated in the risk assessment will be identified. The data will be managed in a database

system to facilitate data reduction and development of summary statistics. Information pertaining to data reduction and the selection of chemicals of potential concern (COPCs) is presented in the subsections below.

5.5.4 Guidelines for Data Reduction

The following guidelines for data reduction will be used to produce data summaries for each medium of concern and each potential exposure pathway, for use in developing the BHHRA. These approaches are consistent with RAGS, Volume 1, Human Health Evaluation Manual (Part A) (EPA, 1989) and EPA Region 6 Risk Assessment Guidance (EPA, 1995).

- If a chemical is not positively identified in any sample from a given medium, because it is reported as a nondetect and/or because of blank contamination (as explained below), it will not be addressed for that medium. A chemical will be carried forward into the risk assessment at one-half of the detection limit if a chemical's detection limit is higher than the respective screening value.
- The EPA's exposure point concentration guidance document entitled, "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites" (OSWER 9285.6-10, December 2002) will be used to determine the appropriate means for deriving confidence limits on the concentrations of chemicals that are below detection in one or more samples from a given medium and sampling location.
- If a chemical is reported in a field sample and in a method blank or field blank, it will be considered as a positive identification if the chemical is present in the field sample at a concentration greater than 10 times (for common laboratory contaminants) or 5 times (for all other substances) the maximum concentration reported in any blank. Common laboratory contaminants include acetone, methylene chloride, methyl ethyl ketone (2-butanone), phthalate esters, and toluene.
- "J" values are estimated concentrations for measurements reported below the minimum confident quantitation limit in a given medium. All data with "J" qualifiers will be assumed to be positive identifications for the chemical in that medium and the corresponding reported concentrations will be used.
- If a chemical is reported as a nondetect in a sample set containing at least one detection, it will be assumed to be present at one-half of the sample quantitation limit for that sample in the calculation of the mean concentration and 95% UCL.
- Duplicate samples from the same sampling location will be considered as one data point in summarizing the frequency of detection and in calculating the 95% UCL. The values reported for the duplicate samples will be averaged and the average concentration will be entered as the concentration for that sampling location. However, the analytical results of all duplicate samples will be used in summarizing the minimum and maximum detected and nondetected concentrations.

- For all sample locations where soils were sampled at multiple depths for a single location, the results from the various depths will be treated as individual data points in summarizing the data.
- In general for risk assessment purposes, the available groundwater data will be reviewed with consideration of sampling methodologies that do not meet the following guidelines:
 - Sampling methodologies should not artificially increase or decrease naturally suspended particle concentrations.
 - Groundwater samples should be collected using a low flow rate.
 - Groundwater samples should generally not be filtered.

5.5.5 Guidelines for Selecting Chemicals of Potential Concern

As part of the selection process for chemicals of potential concern (COPCs), media-specific detection limits are compared with media-specific regulatory screening levels. The purpose of this comparison is to determine whether a given COPC's detection limit is sufficiently low to ensure that at exposure levels below the detection limit (i.e., nondetects only) there will be no non-cancer health hazards or elevated cancer risks in any exposed receptor. Contaminants not excluded by comparison with an appropriate screening level according to the guidelines described below will be evaluated according to the full BHHRA process.

In Appendix I, media-specific detection limits for the VOCs, SVOCs, metals, polychlorinated biphenyls (PCBs), pesticides, and herbicides that might reasonably be anticipated to be present at a site used as an oil refinery or for hazardous waste disposal (both of which apply to the Falcon Site) are compared to EPA Region 6 Human Health Media-Specific Screening Concentrations (MSSLs), TCEQ Tier 1 Protective Concentration Levels (PCLs), and EPA Maximum Contaminant Levels (MCLs) for drinking water.

The following screening criteria will be used to select or eliminate substances as COPCs. These screening criteria are based on EPA guidance (EPA, 1989) as modified by EPA Region 6 (EPA, 1995).

- A chemical will generally be excluded as a COPC within a given medium if it was not detected in any samples from that medium, provided all detection limits are lower than the media-specific screening levels. However, a chemical will be retained for risk assessment if additional information suggests that the chemical may be present at the site.
- A chemical will be excluded as a COPC if it was detected in less than 5% of the samples and was not reported at concentrations exceeding EPA Soil Screening Levels (SSLs) (EPA, 1996a) or federal drinking water maximum contaminant levels (MCLs), provided all the detection limits are lower than these screening levels. At least 20 samples of a particular medium are needed before the frequency-of-detection rule can be applied. Therefore, if less than 20 samples from a given medium are available the chemical will not be excluded as a COPC based on its frequency of detection.

- Arithmetic means will be calculated for site-related and background data based on detected concentrations at each sampling location. Although site-related data for inorganic compounds will be compared with background data, COPCs will not be screened out based on a background comparison. Rather, the BHHRA will evaluate risk based on all COPCs. In addition, the relative contribution of any below-background inorganic compounds to the total risk will be considered separately and discussed further in the uncertainty analysis.
- Inorganic chemicals that are essential human nutrients (e.g., calcium, iron, potassium, magnesium, and sodium) will not be evaluated as COPCs. Those inorganic chemicals that are both essential human nutrients and toxic at higher concentrations (e.g., zinc and selenium, among others) will be evaluated as COPCs.
- If analysis results in tentative identification of a chemical such that it can be classified as a Tentatively Identified Compound (TIC), it will be excluded from the risk assessment if it is not found to be a transformation product of chemicals present at the site and if there is no reason to believe that it is associated with current or historical site activities. If a TIC does not meet these criteria it will be added to the list of chemicals to be evaluated. Only those TICs that are possible degradation products of chemicals associated with site activities, or are potentially associated with site activities, will be evaluated.
- Any reported chemical that is a member of a chemical class of which other members are selected as COPCs will be retained in the risk assessment (e.g., polycyclic aromatic hydrocarbons [PAHs]).

5.5.6 Conceptual Exposure Pathways Assessment

The objectives of the exposure assessment will be to characterize potentially exposed human receptors in the area associated with the former Falcon Refinery, to identify potential exposure pathways, and to establish upper limits on exposure for the most highly exposed receptors. The exposure assessment will incorporate the following key elements.

- Definition of land use.
- Definition of local water use.
- Identification of potential receptors and exposure scenarios.
- Identification of exposure routes.
- Estimation of exposure point concentrations.
- Estimation of daily doses.

As described in Section 5.5.11, the CSM Flowchart (Figure 15) shows the potential human exposure pathways arising from the Site. Development of the CSM's exposure pathways was based on present and anticipated uses of the Site and the nearby land, wetlands, and estuarine/marine features, in addition to other criteria discussed below.

5.5.7 Setting

The Site consists of an approximately 104-acre refinery that operated intermittently and is currently inactive. It is located near Ingleside, Texas in San Patricio County, Texas, at the north and south corners of the intersection of FM 2725 and Bishop Road. When in operation, the refinery had a capacity of 40,000 barrels per day and the primary products consisted of naphtha, jet fuel, kerosene, diesel and fuel oil. Another portion of the site includes a dock facility on Redfish Bay, where materials were transferred between barges and storage tanks. The Site is bordered by wetlands to the east, northeast and southeast, residential areas to the north and southwest, and construction companies to the south and north.

5.5.8 Current and Future Land Use

Land use adjacent to the Site is comprised of predominantly industrial facilities (Figure 6). However, there are residences immediately west (at the intersection of FM 2725 and Bishop Road) and north of the refinery Site along Thayer Road. The Site is bordered by wetlands to the east, northeast, and southeast, residential areas to the north, west, and southwest, Plains Marketing (crude oil storage) to the northwest, and Garrett Construction Company to the south (Figure 6). Since 1986, refinery production activities have not occurred at the Site. Currently, land use at the site is limited to the several ASTs located on the refinery portion of the Site and the docking facility, which is used for crude oil storage and transportation.

The Site is located outside the Ingleside city limits and therefore does not occur within specific zoning areas. San Patricio County does not zone property except as to flood plain status. According to the San Patricio County Surveyor, the Site is located within an industrial area, but is not zoned as industrial or commercial. The county surveyor indicated that if the Site were to be used for residential development in the future, the developer would be required to acquire permits through the county health department. This is the means by which the county is able to control how the property could be used in the future. The county surveyor stated that it would be unlikely that the county would ever allow the Site to be used for anything other than industrial type activity. As such, it is anticipated that that use of the areas bordering the Site will likely remain unchanged in the foreseeable future.

The on-site areas of the Site will be evaluated using industrial and trespasser scenarios. All off-site areas will be evaluated using a residential scenario. Potential recreational uses will be evaluated in the on- and off-site wetlands and the areas adjacent to the current and historical docking facilities.

5.5.9 Surface Water and Groundwater Resources and Uses

Discussion of surface water and groundwater resources associated with the site is provided in the following sections.

5.5.9.1 Surface Water

The site is located in the San Antonio-Nueces Coastal Basin. The Site lies approximately 5 feet above sea level and drains into the on-site wetlands. The topography of the Site is gently sloping to the southeast as revealed by the Port Ingleside, Texas U.S.G.S. topographic map. Surface water drainage from the Site enters the wetlands along the southeastern section of the abandoned refinery. A culvert connects the on-site palustrine/estuarine wetlands to the estuarine wetlands. The wetlands then connect to the Intracoastal Waterway and Redfish Bay. A detailed discussion of Site topography is presented above in Section 2.2.1.4. A discussion of surface water use associated with the in-water segments identified in Section 2.2.1.4 is presented below.

5.5.9.2 Groundwater

Shallow groundwater is detected at depths typically less than eight feet at the adjacent Plains Marketing facility. Additional information indicates that there are two registered shallow (approximately 40 feet bgs) residential water wells located on property east of the Site (on Thayer Road). State of Texas Water Well Reports indicated that the wells are screened in a sand at a depth of 40 to 45 feet below land surface.

During interviews, the EPA and NORCO personnel determined the existence of five domestic water wells in proximity to the Site, on Thayer Road (Figure 7). According to EPA, at least one resident living on Thayer Road uses the groundwater for consumption. It is noted that the resident does not have any information concerning the completion depth of the well or the depth to usable-quality water. Additional data on site-related groundwater will become available upon completion of the additional site investigation activities.

5.5.10 Potentially Exposed Populations

Based on EPA's recommendations and as indicated in Section 5.5.8 above, the on-site areas will be evaluated using industrial and trespasser scenarios; the off-site residential areas will be evaluated using a residential scenario; and potential recreational uses will be evaluated in the on- and off-site wetlands and the areas adjacent to the current and historical docking facilities. Realistic exposure scenarios will be used to assess the health risks to receptors of substances originating from the Site. Residential scenarios will consider families' consumption of produce grown in their home gardens and children's exposure to soil while playing in their yards. If new information suggests other potentially exposed populations, the CSM will be revised accordingly.

5.5.11 Conceptual Site Model

The CSM Flowchart (Figure 15) and CSM Schematic for Human Receptors (Figure 16a) show potential exposure sources, affected media, release mechanisms, routes of migration, and human receptors. The purpose of the CSM is to provide a framework for identifying potential on-site and off-site exposure pathways and to help identify data gaps in the exposure evaluation.

5.5.12 Exposure Pathways

An exposure pathway consists of four elements (EPA, 1989) and includes:

- A source and mechanism of chemical release.
- A retention or transport medium.
- A point of potential human contact with the contaminated medium.
- A route of exposure (inhalation, ingestion, or dermal) at the contact point.

When all of these elements are present, the pathway is considered complete. The assessment of pathways by which human receptors may be exposed to chemicals includes an examination of existing migration pathways (e.g., water or soil) and exposure routes (e.g., inhalation, ingestion, or dermal) as well as those that potentially may occur in the future.

In the CSM Flowchart (Figure 15), primary, secondary and tertiary release mechanisms are identified and potential exposure pathways and exposure routes are delineated for each receptor.

Potential human exposure pathways to be evaluated include but are not limited to: ingestion of and dermal contact with surface and subsurface soil, groundwater, sediment, and surface water and ingestion of biota (e.g., fish and shellfish) exposed via surface water and sediment. In addressing surface water and sediment exposure pathways we will utilize the relevant TCEQ guidance document (TCEQ 2002).

In addition, inhalation pathways associated with soil and groundwater will be evaluated.

5.5.13 Exposure Point Concentrations

For media other than groundwater, the lower of the 95% UCL of the arithmetic mean and the maximum detected value for each COPC will be used to calculate the exposure point concentrations (EPCs) and exposure doses for each medium (e.g., soil and sediment). The 95% UCL will be calculated according to the procedures discussed in the EPA's UCL exposure point concentration guidance document entitled, "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites" (OSWER 9285.6-10, December 2002).

When determining maximum concentrations and 95% UCLs we will consider the size of the exposure area in accord with TCEQ guidance (TCEQ 2002). For sampling of surface waters and sediments we will ensure that depositional areas are targeted and that receptor exposure pathways are taken into account (TCEQ 2002),

Exposure point concentrations for soil will be developed taking into account potential "hot spots" of contamination. The term "hot spot" is used to describe a localized area where one or more chemicals occurs in concentrations substantially greater than those found elsewhere in a facility zone. The distribution of chemicals on the Site will be reviewed to determine if hot spots

exist. If a hot spot is identified, the hot spot data will be evaluated independently of the data representing the remainder of the zone (i.e., separate exposure concentrations will be calculated for the hot spot and the rest of the zone). This approach will provide prioritization of remedial actions to specific portions of the Site and help define the extent of any necessary remediation.

When using groundwater data for risk assessment purposes, the estimated COPC concentrations must reflect the reasonable maximum concentrations in the aquifer of concern. For this reason, the maximum detected concentration of each COPC in the most recent two years, if such data are available, will be used as the exposure point concentrations.

5.5.14 Exposure Models and Assumptions

This step of the assessment describes the mathematical models that will be used to calculate the dose of each COPC within each applicable exposure route. The mathematical models and exposure parameters that will be used to calculate doses are those recommended by national and regional EPA guidance (EPA, 1989; 1991c; 1995; 1997a). Where appropriate, estimates of dermal and incidental ingestion exposures via surface waters and sediments for recreational use scenarios will rely upon the default values and assumptions described in the relevant TCEQ guidance document (TCEQ 2002).

When feasible, site-specific exposure assumptions based on professional judgment will be incorporated into the exposure models. Chemical-specific equations and values used in estimating doses will be provided in the risk assessment report.

Several types of dose metric will be utilized. The health-effects dose (i.e., the dose metric for evaluating the potential for non-cancer health effects) will be averaged over the actual exposure duration. The cancer-risk dose (i.e., the dose metric for evaluating the potential cancer risk) will be averaged over a 70-year lifetime. The exposure doses will be expressed in units of milligrams of contaminant per kilogram body weight per day (mg/kg-day). Health-effects doses and cancer-risk doses will be calculated under the reasonable maximum exposure (RME) scenario for each potential receptor.

Assumptions concerning the duration and frequency of exposure and the routes of exposure to be evaluated will be based on site-specific information when available and will be documented. In the absence of site-specific information or other guidance, EPA default values will be used.

5.5.15 Toxicity Assessment and Documentation

The toxicity assessment will identify appropriate toxicity values for the COPCs at the site. These toxicity values will be applied to the estimated doses to evaluate cancer risks and potential non-cancer health effects. A recent EPA directive entitled "Human Health Toxicity Values in Superfund Risk Assessments" (EPA, 2003) revises the recommended hierarchy of human health toxicity values originally presented in EPA's RAGS Part A (EPA, 1989). The Integrated Risk Information System (IRIS) remains in the first tier (Tier I) of the recommended hierarchy as the

generally preferred source of human health toxicity values. IRIS generally contains reference doses (RfDs), reference concentrations (RfCs), cancer slope factors, drinking water unit risk values, and inhalation unit risk values that have gone through a peer review and EPA's consensus review process. IRIS normally represents the official Agency scientific position regarding the toxicity of the reviewed chemicals based on the data available at the time of the review.

The second tier (Tier II) is EPA's Provisional Peer Reviewed Toxicity Values (PPRTVs), which are available at EPA Region 6. Generally, PPRTVs are derived for one of two reasons. First, the Superfund Health Risk Technical Support Center (STSC) is conducting a batch-wise review of the toxicity values in the Health Effects Assessment Summary Tables (HEAST), now a Tier III source. As such reviews are completed, those toxicity values will be removed from HEAST, and any new toxicity value developed in such a review will be a PPRTV and placed in the PPRTV database. Second, Regional Superfund offices may request a PPRTV for contaminants lacking a relevant IRIS value. The STSC uses the same methodologies to derive PPRTVs for both.

The third tier (Tier III) includes other sources of information. Priority will be given to sources that provide toxicity information based on similar methods and procedures to those used for Tier I and Tier II, contain values which are peer reviewed and available to the public, and are transparent about the methods and processes used to develop the values. Consultation with the STSC or headquarters' program office is recommended regarding the use of the Tier III values for Superfund response decisions when the contaminant appears to be a risk driver for the site. In general, draft toxicity assessments are not appropriate for use until they have been through peer review, the peer review comments have been addressed in a revised draft, and the revised draft is publicly available.

Additional sources may be identified for Tier III. Toxicity values that fall within the third tier in the hierarchy include, but need not be limited to, the following sources:

- The California Environmental Protection Agency toxicity values are peer reviewed and address both cancer and non-cancer effects.
- The Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels (MRLs) are estimates of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse non-cancer health effects over a specified duration of exposure. The ATSDR MRLs are peer reviewed.
- HEAST toxicity values are Tier III values. As noted above, the STSC is conducting a batch-wise review of HEAST toxicity values. The toxicity values remaining in HEAST are considered Tier III values.

If a Tier I or II toxicity value is not available then we will use expert judgement in identifying a suitable value under the broad guidelines for Tier III sources noted above. In accord with EPA's recommendation we will consult with the STSC or headquarters' program office regarding the use of a given Tier III source if the contaminant appears to be a risk driver for the site. If we are

unable to identify an appropriate toxicity value for a given chemical it may not be possible for us to evaluate the potential for health effects or cancer risk with a reasonable degree of confidence. In that case what predictions we can make concerning the chemical's potential health effects or cancer risk will be addressed in our report and discussed qualitatively in the uncertainty analysis. Furthermore, it may be appropriate to use a surrogate toxicity value in the absence of a suitable toxicity value for a given COPC. For example, benzo(a)pyrene is often used as a surrogate for structurally-related polycyclic aromatic hydrocarbons with limited toxicity data.

Cancer slope factors (CSFs) will be identified for those COPCs classified by EPA as carcinogens and RfDs or RfCs will be identified if available. To the extent that reliable subchronic non-cancer toxicity values can be identified they may be used to assess the potential for non-cancer health effects in future on-site industrial workers, on-site/off-site trespassers, and off-site recreational users because the exposure durations for these receptors are expected to be less than 1 year. In the absence of suitable subchronic toxicity values, chronic toxicity values will be employed. Chronic non-cancer toxicity values will be used for the child receptor and other residential receptors.

RfDs and CSFs will be expressed in the BHHRA in the same units as in IRIS, mg/kg-day and (mg/kg-day)⁻¹, respectively. Cancer unit risk factors will be converted to CSFs according to EPA guidance (EPA, 1997b).

In the absence of gastrointestinal absorption adjustment factors for inorganic compounds, a default value of 1 (i.e., no adjustment) will be used (EPA, 2004). It is noted that EPA does not recommend the use of g.i. absorption factors for deriving dermal toxicity factors from oral toxicity factors for organic compounds (EPA, 2004).

5.5.16 Risk Characterization

The objective of the risk characterization is to integrate the information developed in the exposure assessment and the toxicity assessment into an evaluation of the potential current and future health risks associated with the COPCs at the site. The potential for non-cancer health effects will be evaluated for all COPCs. The potential for cancer risk will be evaluated only for those chemicals categorized by EPA as Group A, B, or C carcinogens and for those chemicals that are currently not categorized but for which a cancer slope factor is available. The total potential risks posed by organic and inorganic COPCs will be characterized both with and without inclusion of inorganic compounds not detected above background.

5.5.17 Cancer Risks

Cancer risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. Potential excess lifetime cancer risk (ELCR) will be calculated by multiplying the chronic daily intake averaged over 70 years by the exposure route-specific (oral, inhalation, or dermal) cancer slope factor (CSF), as follows:

$$\text{ELCR} = \text{CDI} * \text{CSF}$$

Where:

ELCR = A unitless probability (e.g., 2.0×10^{-5}) of an individual developing cancer
CDI = Chronic daily intake (intake averaged over a 70-year lifetime) (mg/kg-day)
CSF = Chemical- and route-specific cancer slope factor (mg/kg-day)⁻¹

For each exposure scenario, cancer risks will be summed separately over each chemical, each exposure route, and all chemicals and exposure routes.

An ELCR of 1.0×10^{-6} indicates that an individual experiencing the RME estimate has an estimated 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. This is referred to as an ELCR because it would be in addition to the risks of cancer individuals face as a result of their genetic make-up or from other environmental causes such as smoking, alcohol consumption, or exposure to ultraviolet radiation from the sun. An excess cancer risk for site-related exposures from 1.0×10^{-4} to 1.0×10^{-6} (equivalent to an extra risk of 1 in 10,000 to 1 in 1,000,000 above the background rate, respectively) is the range that EPA generally considers acceptable. Site-related cancer risks will be reported for all COPCs that pose a risk of 1.0×10^{-6} or greater. For COPCs with cancer risks between 1.0×10^{-4} and 1.0×10^{-6} we will make recommendations pertinent to a risk management decision based on our understanding of the chemical's toxicology and site-specific exposure pathways.

5.5.18 Non-Cancer Health Effects

EPA derives chemical-specific non-cancer toxicity parameters called reference doses (RfDs) and publishes these values online in the IRIS (Integrated Risk Information System) database. According to the online IRIS glossary (accessed 4/29/07), The RfD is "An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime." The ratio of exposure to toxicity is called the Hazard Quotient (HQ). According to EPA's online National Air Toxics Assessment glossary (accessed 5/8/07), The HQ is the "ratio of the potential exposure to the substance and the level at which no adverse effects are expected. If the Hazard Quotient is calculated to be less than 1, then no adverse health effects are expected as a result of exposure. If the Hazard Quotient is greater than 1, then adverse health effects are possible. The Hazard Quotient cannot be translated to a probability that adverse health effects will occur, and is unlikely to be proportional to risk. It is especially important to note that a Hazard Quotient exceeding 1 does not necessarily mean that adverse effects will occur." The Hazard Index (HI) is generated by summing the HQs for all COPCs that affect the same target organ (e.g., liver) or that act through the same mechanism of action within a medium or across all media to which a given individual may reasonably be exposed. An HI of less than 1 indicates that, based on the sum of all HQ's from different contaminants and exposure routes, non-cancer health effects from all contaminants are not of concern. An HI greater than 1 indicates that site-related exposures exceed the level deemed protective of the most susceptible subpopulations and that a more sophisticated risk evaluation

(based on toxicologic investigation and site-specific assessment) is warranted unless action is taken to lower the potential for human exposures. The HQ will be calculated as follows:

$$\text{Non-cancer HQ} = \text{CDI} / \text{RfD}$$

Where:

HQ = Hazard quotient (unitless)

CDI = Chronic daily intake (averaged over the exposure period) (mg/kg-day)

RfD = Reference dose (mg/kg-day)

As indicated above, the HI will be generated by summing the HQs for all COPCs that affect the same target organ or that act through the same mechanism of action. Separate HIs will be generated for each receptor scenario, exposure route, and chemical, and a total HI will be calculated for all chemicals and exposure routes.

5.5.19 Identification of Limitations / Uncertainty Analysis

The uncertainty analysis will present the major assumptions and uncertainties associated with the risk assessment, including general uncertainties associated with the risk assessment process and site-specific uncertainties associated with the Site. The uncertainty in the evaluation of the probability of health effects and increased cancer risk will be discussed qualitatively. The focus will be on those chemicals and exposure pathways that pose a potential cancer risk of greater than 1 in 1,000,000, or have a total hazard index of greater than one.

5.5.20 Approach for Developing Preliminary Remediation Goals

EPA Region 6 Human Health Medium Specific Screening Levels (MSSLs) or TCEQ Tier 1 Residential PCLs, whichever is more stringent, will be used to define the Preliminary Remediation Goals (PRGs).

The approach for calculating PRGs is discussed in EPA's PRGs directive entitled, "Human Health Evaluation Manual, Part B: Development of Risk-Based Preliminary Remediation Goals" (OSWER Directive 9285.7-01B, December 13, 1991). Part B provides guidance on using U.S. Environmental Protection Agency (EPA) toxicity values and exposure information to derive risk-based PRGs. Initially developed at the scoping phase using readily available information, risk based PRGs generally are modified based on site-specific data gathered during the remedial investigation/feasibility study (RI/FS).

Chemical-specific PRGs are concentration goals for individual chemicals for specific medium and land use combinations at CERCLA sites. There are two general sources of chemical-specific PRGs: (1) concentrations based on ARARs and (2) concentrations based on risk assessment.

The recommended approach for developing remediation goals is to identify PRGs at scoping, modify them as needed at the end of the RI or during the FS based on site-specific information

from the baseline risk assessment, and ultimately select remediation levels in the Record of Decision (ROD).

In general, the equations described in EPA's PRG directive are sufficient for calculating the risk-based PRGs at the scoping stage of the RI/FS. Note, however, that these equations are based on standard default assumptions that may or may not reflect site-specific conditions.

The establishment of PRGs early in the RI process serves as the basis for the RI/FS FSP and QAPP. Detection limits of the proposed analytical methods will be reviewed before the FSP and QAPP are completed to ensure that they are sufficiently low to characterize the Site with respect to both health and ecological risks. To the extent feasible, analytical methods chosen will have detection limits less than human health and ecological risk screening levels.

5.6 Baseline Ecological Risk Assessment

This Baseline Ecological Risk Assessment (BERA) Plan provides an overview of the methods to be used in conducting the ecological risk assessment for the Site. Further information on the Site location and history is presented in Section 2 of this RI/FS Work Plan.

EPA guidance (EPA, 1997) defines ecological risk assessment for the federal Superfund Program as a "qualitative and/or quantitative appraisal of the actual or potential impacts of contaminants from a hazardous waste site on plants and animals other than humans and domesticated species."

The methods that will be used to conduct the former Falcon Refinery Superfund BERA will conform to current EPA guidance including but not limited to EPA 1989b, EPA1992a, EPA 1992b, EPA 1993 and EPA 1997. The BERA process for the site will include the following eight steps (Figure 17) in accordance with the Order:

- Step 1 Screening-Level Problem Formulation and Ecological Effects Evaluation.
- Step 2 Screening-Level Exposure Estimate and Risk Calculation.
- Step 3 Baseline Risk Assessment Problem Formulation.
- Step 4 Study Design and Data Quality Objective Process.
- Step 5 Field Verification of Sampling Design.
- Step 6 Site Investigation.
- Step 7 Risk Characterization.
- Step 8 Risk Management.

The methods that will be used to conduct site ecological risk assessment include a conservative screening of contaminants against ecotoxicity benchmarks (i.e., screening ecological risk assessment as presented in Steps 1 and 2). The methods also describe site-specific field studies that could be considered as part of a definitive ecological risk assessment if the results of the screening assessment indicate that this is necessary (Steps 3 through 8).

The Screening-Level Ecology Risk Assessment Report will include a discussion of the topography encountered, during the RI sampling effort within the sediment sampling area to allow an understanding of the depositional areas sampled.

5.6.1 Screening-Level Problem Formulation and Ecological Effects Evaluation – Step 1

A screening-level problem formulation and ecological effects evaluation (Figure 17) includes evaluation of site-specific information for determining the nature and extent of contamination and characterizing ecological receptors at the site under investigation. In addition, the screening-level problem formulation includes the development of a Conceptual Site Model (CSM) and the identification of the chemicals of potential ecological concern (COPECs). The CSM developed for ecological receptors addresses the following five issues:

- Environmental setting and contaminants known or suspected to exist at the site.
- Contaminant fate and transport mechanisms.
- Mechanisms of ecotoxicity associated with contaminants and likely categories of affected receptors.
- Complete exposure pathways.
- Selection of endpoints to screen for ecological risk.

The CSM Flowchart for Human & Ecological Receptors (Figure 15) shows potential migration pathways and receptor scenarios to be considered in developing ecological risk evaluations for site contaminants under existing and future conditions. The CSM Schematic for Ecological Receptors (Figure 16b) depicts the general features of these exposure scenarios in a non-technical manner.

5.6.1.1 Data Evaluation

The screening-ERA will use all available site data. All historical information on the hazardous substances present in and around the site as provided in the documents referenced in Section 2 of this RI/FS Work Plan will be reviewed and used where applicable and appropriate. Additionally, results of sampling conducted as part of the additional site activities proposed in this RI/FS Work Plan will be included in the data evaluation.

All sampling locations and the associated data used for the exposure scenario evaluation in the risk assessment will be identified. The data will be managed in a database system to facilitate data reduction and development of summary statistics. Information pertaining to data reduction and the selection of COPECs is presented in the subsections below.

5.6.1.2 Guidelines for Data Reduction

The following guidelines for data reduction will be used to produce the data summaries for each medium of concern and potential exposure pathway for the screening-ERA. These approaches are consistent with RAGS, Volume II, Environmental Evaluation Manual (EPA, 1989), Ecological Risk Assessment Guidance for Superfund (1997), Issuance of Final Guidance: Ecological Risk Assessment and Risk Management Principles for Superfund Sites (1999) and

TCEQ (2001 and 2006) Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas (RG-263).

- If a chemical is not positively identified in any sample from a given medium, because it is reported as a nondetect and/or because of blank contamination (as explained below), it will not be addressed for that medium. A chemical will be carried forward into the risk assessment at ½ of the detection limit if the chemical's detection limit is higher than the respective screening value.
- The EPA's Upper Confidence Limits (UCL) exposure point concentration guidance documents entitled, "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites" (OSWER 9285.6-10, December 2002) will be referred to in determining the appropriate use of non-detects values in the risk assessments.
- If a chemical is reported in a field sample and a method or field blank, it will be considered a positive identification if the chemical is present in the field sample at a concentration greater than 10 times (for common laboratory contaminants), or 5 times (for all other substances) the maximum concentration reported in any blank. Common laboratory contaminants include acetone, methylene chloride, methyl ethyl ketone (2-butanone), phthalate esters, and toluene.
- "J" values are estimated concentrations reported below the minimum confident quantitation limit. All data with "J" qualifiers will be assumed as positive identifications for that medium and the corresponding reported concentrations used.
- If a chemical is reported as a non-detect in a sample set containing at least one detection, it will be assumed to be present at one-half of the sample quantitation limit for that sample in the calculation of the mean concentration and the 95% UCL concentration of the arithmetic mean.
- Duplicate samples from the same sampling location will be considered as one data point in summarizing the frequency of detection and in calculating the 95% UCL concentrations. The values reported for the duplicate samples will be averaged, and the average concentration will be assumed as the concentration for that sampling location. However, the analytical results of all duplicate samples will be used in summarizing the minimum and maximum detected and non-detected concentrations.
- For all sample locations where soils were sampled at multiple depths for a single location, the results from the various depths will be treated as individual data points in summarizing the data.
- In general for risk assessment purposes, the available groundwater data will be reviewed with consideration of sampling methodologies that do not meet the following guidelines:
 - Sampling methodologies do not artificially increase or decrease naturally suspended particle concentrations.
 - Groundwater samples should be collected using a low flow rate.

- Groundwater samples should generally not be filtered.

5.6.1.3 Guidelines for Selecting Chemicals of Potential Ecological Concern

The following screening criteria will be used to select or eliminate chemicals as COPECs based on EPA guidance (EPA, 1989), as modified by EPA Region 6 (EPA, 1995):

- A chemical will generally be excluded as a COPEC for a medium if it was not detected in any samples from that medium, provided the detection limits are lower than the media-specific screening levels. However, a chemical will be retained for the risk assessment if additional information suggests that the chemical may be present at the site.
- A chemical will be excluded as a COPEC if it was detected in less than 5% of the samples and was not reported at concentrations exceeding screening levels, or above federal drinking water maximum contaminant levels (MCLs), provided all the detection limits are lower than these screening levels. At least 20 samples of a particular medium are needed before the frequency of detection rule can be applied. As a result, frequency of detection will not be applied if less than 20 samples of a given medium are available.
- Arithmetic means will be calculated for the site-related and background data, based on detected concentrations at each sampling location. The data for inorganic compounds will be compared with background data, but only non-bioaccumulative COPECs will be screened out based on a background comparison. In addition, the relative contribution of the inorganic compounds that are not above background to the total risk will be considered separately and discussed further in the uncertainty analysis.
- If a chemical is identified as a tentatively identified compound (TIC), it will be excluded from the risk assessment, if it is not found to be a transformation product of chemicals present at the site, and if there is no reason to believe that it is associated with current or historical site activities. If a TIC does not meet these criteria, it will be added to the list of chemicals to be evaluated. Only those TICs that are possible degradation products of chemicals associated with site activities, or are potentially associated with site activities, will be evaluated.
- Any member of a chemical class that has other members selected as COPECs will be retained in the risk assessment (i.e., polycyclic aromatic hydrocarbons [PAHs]).

5.6.2 Screening-Level Exposure Estimate and Risk Calculation – Step 2

In the initial ecological risk screening assessment, the ecological effects will be evaluated on a preliminary basis and contaminant exposure levels that represent conservative thresholds for adverse ecological effects will be established. The screening ecotoxicity values will represent a No-Observed-Adverse Effect (NOAEL) level for chronic exposure to a sensitive receptor species.

Maximum reported COPEC concentrations will be compared to ecological benchmarks associated with surface water, sediment, and also compared to the respective laboratory quantitation and method detection level. The benchmarks represent conservative ecotoxicity values for invertebrates and plants exposed to COPECs in sediment (freshwater or marine), soil and surface water (freshwater or marine). (Note that waters and sediments will be defined on the amount of total dissolved solids measured (in the over lying water, in the case of sediment) in parts per thousand [‰]: fresh—0.5‰, brackish—0.5-30‰, salt—30-50‰ and brine→50‰.) Peer reviewed ecotoxicity benchmarks will be selected for the screening-level risk comparisons. The selected ecological benchmarks for the site are included in Appendix H (Comparison of Quantitation Limits to Ecological Screening Standards).

COPECs that exceed the selected ecological benchmarks will be retained as COPECs as described in detail by the data reduction method. Bioaccumulative COPECs, including individual and total polycyclic aromatic hydrocarbons, will be retained for further evaluation if they are detected in any site media potentially posing a risk of bioaccumulation to higher trophic levels, even if they are present at concentrations below the screening-level benchmark. (Determination of bioaccumulative COPECs will be based in Table 3-1 of TCEQ's 2001 ERA guidance [as revised in 2006] and/or the methods described within their guidance. Such chemicals are identified in Appendix H herein.) Chemicals without screening levels will be carried forward in the ecological risk assessment, including those chemicals where their quantitation limits exceed their respective screening levels if there is any data indicating that the chemical could be present at the Site. This is because COPECs that bioaccumulate may pose a significant risk to higher trophic level organisms if they biomagnify through the food chain. Selected COPECs will be retained for further evaluation in the BERA. This step of the ecological risk assessment process will conclude with a scientific-management decision point (SMDP). If there are no COPECs retained based on the ecological screening, decision will be made whether the screening-level ecological risk assessment is adequate to assess the potential for risk to ecological receptors and whether the potential risk is acceptable. If a decision of inadequacy or that the potential risk is unacceptable or indeterminable, then the risk assessment process will continue through more detailed assessment steps (Steps 3 through 7).

5.6.2.1 Approach for Developing Ecological Screening Levels

5.6.2.1.1 Soil

Ecological screening levels for soil in the risk assessment will be based on the soil screening levels for target receptor plants and invertebrate communities and will be obtained from the Guidance for Conducting Ecological Risk Assessment at Remediation Sites in Texas [TCEQ] or other sources [e.g., Oak Ridge National Laboratory (ORNL) Risk Assessment Information System (RAIS), Center for Disease Control, National Institute of Health, and EPA].

5.6.2.1.2 Groundwater / Surface Water

Screening levels for groundwater and surface water will be based on Federal ambient water quality criteria (AWQC) (40 CFR 131.36), or benchmarks that have been developed by TCEQ

(2006) or ORNL (Suter and Tsao, 1996), whichever value is most conservative/protective. For any benchmark from ORNL that is applied in this assessment, only original values will be used. The 20% adjustment factor generally used by ORNL will not be applied. For certain chemicals where insufficient information was available to calculate criteria, the Federal water quality guidance lists lowest-observed-adverse-effect-levels (LOAELs). These values will be extrapolated to no-observable-adverse-effect-levels (NOAELs) by dividing by a factor of 10, and will also be used for screening purposes in those cases where no other benchmarks are available.

For those contaminants detected in the ground water/surface water at the site that have the potential to bioaccumulate (e.g., pesticides and polychlorinated biphenyls [PCBs]), and a pathway is complete, it will be necessary to evaluate the potential for trophic transfer to terrestrial wildlife in developing screening levels for surface water. The potential for evaluating this pathway as part of the screening-level risk assessment will be discussed further with EPA Region 6 and the state and federal trustees.

5.6.2.1.3 Sediments

Screening levels for sediments will be based on the guidelines for freshwater sediments as proposed in the Guidance for Conducting Ecological Risk Assessment at Remediation Sites in Texas (TCEQ 2006, updated), MacDonald et al. (2000), Ontario Ministry of Environment (OMOE) Sediment Guidelines (OMOE, 1993), the Biological Effect Levels developed by the National Oceanic Atmospheric Administration (NOAA) (Long et al., 1995; Long and Morgan, 1990), and the sediment guidelines developed by the Florida Department of Environmental Protection (FDEP, 1994). All of the above referenced databases, including other sources, will be consulted for appropriate values. A hierarchy of values will be established based upon the factors of conservativeness (protectiveness) and the acceptableness of the method(s) cited for the derivation of the value. In terms of sourcing, benchmarks from TCEQ will be considered first, followed by USEPA Region 5 ESL values, MacDonald (2000), etc.

5.6.2.1.4 Screening-Level Ecological Risk Assessment Report

Based on the results of the screening-level exposure estimation and risk calculation, a decision will be made, with the concurrence from the EPA, that either the screening-level ecological risk assessment (Steps 1 and 2) is adequate to determine that ecological threats are negligible, or the process should continue to a more detailed baseline ecological risk assessments (Steps 3 through 8).

Specifically, the three possible conditions with respect to the BERA at this point include:

- There is adequate information to conclude that ecological risks are negligible and therefore no need for remedial action on the basis of ecological risk.
- The information is not adequate to make a decision at this point, and the ecological risk assessment process will continue (Steps 3 through 8).

- The information indicates a potential for adverse ecological effects, and a more thorough assessment is warranted.

A Draft Screening-Level Ecological Risk Assessment (SLERA) Report that documents the decision and its basis will be prepared and submitted to EPA for review and approval according to the project schedule in the Final RI/FS Work Plan. The Amended Draft SLERA will be prepared and submitted within 45 calendar days of receipt of the EPA's comments. A Final SLERA will be submitted within 30 days of the EPA's approval of the Amended Draft SLERA.

5.6.3 Baseline Ecological Risk Assessment

If the SLERA Report indicates a need for further ecological risk evaluation, a BERA will be required.

The basic components of the BERA (Figure 17) include:

- Problem Formulation (Step 3)
- Characterization of Exposure (Step 3)
- Characterization of Ecological Effects (Step 3)
- Risk Characterization (Step 7)

Additional components of the BERA design to completely develop and substantiate the results of the basic BERA components identified above include:

- Study Design and Data Quality Objective Process (Step 4).
- Field Verification of Sampling Design (Step 5).
- Site Investigation and Analysis Phase (Step 6)

Each of these components is discussed in more detail in the following sections.

The principal guidance documents that will be used in conducting the BERA include, but are not limited to:

- Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments (EPA, 1997)
- Role of Ecological Baseline Risk Assessments (EPA, 1994a)
- Supplemental Region 6 Risk Assessment Guidance (EPA Region 6, 1995)
- Framework for Ecological Risk Assessment (EPA, 1992a)
- Evaluation of Terrestrial Indicators for Use in Ecological Assessments at Hazardous Waste Sites (EPA, 1992b)

- Guidance for Data Usability in Risk Assessment (EPA, 1992c, 1992d)
- Risk Assessment Guidance for Superfund, Vol.2 - Environmental Evaluation Manual (EPA, 1989a)
- Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference (EPA, 1989b)

5.6.3.1 Baseline Risk Assessment Problem Formulation – Step 3

Problem formulation is the first step of the BERA process and establishes the goals, breadth, and focus of the assessment (EPA, 1992a). This step will refine the screening-level problem formulation and expand on the ecological issues that are of concern at the site. It provides an evaluation of the data (including an assessment of data usability), contaminants of potential concern, habitats, receptors, exposure pathways, ecotoxicity, and selection of endpoints for further study (EPA, 1991). For both a screening-level ecological risk assessment and a definitive ecological risk assessment, the product of the problem formulation is a site conceptual model, which identifies the potential chemical transport pathways, receptors, and the areas of primary concern to be addressed in the ecological risk assessment. Following is a description of the components that will be conducted as part of the problem formulation.

At the conclusion of the BERA problem formulation, a Draft BERA Problem Formulation (PF) Report will be prepared and submitted to EPA for review and approval according to the schedule identified in the Final RI/FS Work Plan. An Amended Draft BERA PF Report will be prepared and submitted to EPA within 30 calendar days of the receipt of their comments related to the Draft BERA PF Report. A Final BERA PF Report will be prepared and submitted to EPA within 14 calendar days of receipt of their comments related to the Amended Draft BERA PF Report. The BERA PF Report will discuss the assessment endpoints, exposure pathways, risk questions and the CSM integrating these components. The information presented in the BERA PF Report will be used to select measurement endpoints and to develop the BERA Work Plan and SAP for the site.

5.6.3.1.1 Refinement and Further Characterization of COPECs

As the first task of this step in the BERA problem formulation process, the information used and developed during the screening-level assessment will be reassessed along with any additional site-specific information to refine the scope and goals of the BERA. This process will follow default procedures with the exception that site specific information will be utilized in place of any conservative assumptions used during the screening-level phase.

5.6.3.1.2. Characterization of Habitats

Characterization of potential habitat at the site is another component of the problem formulation, and is briefly presented in this plan to provide some ecological background on the site. Additional information on the ecological setting including terrestrial habitat and vegetation will

be obtained through a site-specific ecological survey to be conducted prior to completing the BERA Report.

5.6.3.1.3 Ecological Site Survey

A detailed description of current terrestrial and aquatic habitat including vegetative cover at the site and surrounding area is not available at this time. A field visit to the site by agency personnel and a qualified field biologist will be conducted prior to starting the risk assessment report. The field visit will allow interested parties to gain a consensus on the types of habitat that are available to ecological receptors at and in the vicinity of the site. Information from this site ecological survey will be included as the first step of the ecological risk assessment report.

5.6.3.1.4 Identification of Ecological Receptors

Identification of the ecological receptors at or in the general vicinity of the site is another component of the problem formulation and is presented in this work plan to provide some ecological background on the site. Selection of potential target receptors that are likely to occur at or in the general vicinity of the site will be completed as part of the problem formulation after conducting a site ecological survey. An attempt will be made during the survey to identify the presence of individual species of mammals, birds, fish, amphibians, and reptiles and their habitats.

A threatened and endangered (T&E) species search using available literature and local non-profit research methods will be conducted as part of the ecological risk assessment to identify the potential for species to occur at or in the vicinity of the site. The site ecological survey will also be used to identify site-specific habitat and the likelihood of species of special status to nest or forage in habitat at or in the vicinity of the site. If the potential for a threatened or endangered species to routinely utilize the site is identified, then the species will be selected as a target receptor. Potential for risk to that species will be evaluated. However, possible occurrence as a T&E species does not confirm that a species is present nor does it preclude other T&E species that are not listed from utilizing habitats within the vicinity of the site.

An endangered species is a native species whose prospect of survival or recruitment within the state is in imminent jeopardy. This determination is based primarily upon the species status in Texas. A threatened species is a native species that, although not presently in danger of extirpation, is likely to become endangered in the foreseeable future in the absence of special protection and management efforts. A special concern species may be one of the following:

Category I—a native species with a presently stable or increasing population that current evidence indicates is especially vulnerable to extirpation because of limited range, low population or other factors.

Category II—a native species identified by technical experts as possibly threatened or vulnerable to extirpation but for which little, if any, evidence exists to document the population level, range or other factors pertinent to its status.

The San Patricio County Texas currently has 29 animal species and no plant species that are listed as endangered or threatened under either federal or state guidelines (Table 1 – Listed and Endangered and Threatened Species).

5.6.3.1.5 Identification of Exposure Pathways

An exposure pathway describes the course a chemical takes from its source to an ecological receptor. An exposure pathway generally consists of 4 elements: 1) a source and mechanism of chemical release, 2) a retention or transport medium, 3) a point of contact with the receptor, and 4) an exposure route (e.g., ingestion) at the point of contact.

Exposure pathways for specific ecological receptors at the site will be identified by medium (i.e., soil, groundwater, surface water, sediment), and discussed in relation to the chemical fate and transport properties of the COPEC. The general taxonomic groups (i.e., mammals, birds, vegetation) potentially at risk from exposure to chemical contamination at the site and the associated exposure pathways have been summarized in a preliminary CSM (Figures 15 and 16b). This preliminary CSM will be refined after data from the site ecological survey has been compiled and will include species-specific target receptors and identification of significant, insignificant, and incomplete exposure pathways.

5.6.3.1.6 Ecotoxicity of Contaminants

Toxicity information will be compiled for the COPECs selected, and presented in a tabular form by receptor group (e.g., birds, mammals, aquatic organisms). For birds and mammals, there will be a brief description of target organs and any other relevant characteristics of toxicity of each chemical. This information will be compiled from a number sources including the RAIS, ATSDR toxicological profiles, the Handbook of Toxic and Hazardous Chemicals and Carcinogens (Sittig, 1985), and the Hazardous Substances Database (HSBD). The most sensitive test mammalian and avian receptors will be listed for each of the COPECs based on a review of the scientific data, and will be represented by those species in which effects were observed at the lowest levels of exposure. In selecting the most sensitive species, oral studies will be used, and preference will be given to feeding and drinking water studies.

Federal and State AWQC will be used to evaluate toxic effects of COPECs of fish and other aquatic species in surface water and the palustrine/estuarine wetlands and Redfish Bay. While AWQC are assumed to be protective of fish and aquatic invertebrates from a surface water standpoint, they do not take into account ingestion of contaminated sediments. The “*sediment to invertebrate*” and “*sediment to fish*” pathways will be addressed in the ecological risk assessment. This evaluation shall also consider population effects as well as possible risks to vertebrates that consume fish and invertebrates exposed to sediment COPECs. Sediment quality criteria and benchmarks for the assessment of toxicological effects on sediment-associated biota will be used to evaluate toxic effects of COPECs on benthic organisms.

Media-specific screening benchmarks for amphibians, reptiles, and plants (receptors to soil) developed by ORNL (Efroymson *et al.* 1997a & 1997b, Jones 1997, Sample *et al.* 1996, 1998, Suter and Tsao 1996) from the RAIS will be used to assess impacts on these receptor groups. It

is recognized that media-specific benchmarks are essential for a rigorous assessment. In some cases, ecotoxicity values may be lacking or may be available for some but not all media and/or receptors. Such circumstances increase the uncertainty associated with the assessment, which will be addressed in an appropriate discussion. In some cases, it may be possible to extrapolate using surrogate chemical data following methods such as those outlined in TCEQ 2001 (§3.5.2).

5.6.3.1.7 Selection of Assessment and Measurement Endpoints, and Testable Hypotheses

Given the potential for ecological impacts to occur at the site, a set of assessment endpoints will be proposed for the purposes of achieving the goals of the environmental assessment. The assessment endpoints represent potentially significant ecological impacts. For each of the designated assessment endpoints, one or more measurement endpoints will be selected based on their ability to integrate modeled, field, or laboratory data with the individual assessment endpoint. For each of the assessment endpoints, testable hypotheses will be identified. The hypotheses provide the structure for evaluation of the results in the analysis phase of the assessment (EPA, 1992a).

Assessment endpoints are explicit expressions of the environmental value that is to be protected (EPA, 1992a). Several criteria that will be considered in selecting assessment endpoints are (Suter, 1989; 1990; 1993):

- Biological relevance.
- Susceptibility to exposure and sensitivity to toxicity.
- Societal relevance.
- Unambiguous operational definition (without this criteria, endpoints provide no direction for testing and modeling, and the results of an assessment tend to be ambiguous)
- Capability of measurement.

Available toxicological information will also be considered in the selection of assessment endpoints. Because the habitats and receptors at a site are unique, there is no standard list of assessment endpoints. Population abundance, community structure, or ecosystem productivity are typically evaluated. Knowing what the valuable ecological receptors are in the vicinity of the site provides a basis for selecting both the assessment and measurement endpoints.

Measurement endpoints are the measurable environmental characteristics that are predictive of the selected assessment endpoint. Measurement endpoints approximate or predict conditions at a site (Maughan, 1993) and link the conditions to the assessment endpoint. The criteria that will be considered in the selection of measurement endpoints include:

- Readily measured or evaluated.
- Corresponds to or is predictive of an assessment endpoint.
- Appropriate to the scale of the site, exposure pathways, and temporal dynamics.

- Low natural variability.
- Rapidly responding and sensitive to receptors.

For the evaluation proposed at the site, evaluation of appropriate measurement endpoints will involve the use of benchmark and literature toxicity values that satisfy many of the listed criteria. Several scenarios will be used to evaluate each impacted media at the site to ensure that potential impacts of contaminants from each media are thoroughly evaluated for each possible receptor group.

5.6.3.1.8 Conceptual Site Model

The primary objective of the problem formulation is the development of a working CSM, which serves to define how contamination might affect ecosystems at the site (Norton et al., 1992). Information provided by the ecological setting characterization, selection of preliminary COPECs, target receptors, exposure pathways, ecotoxicity, and endpoints can be integrated into a model that describes how individual components of the ecosystem may interact with each other and with site-related contamination. The preliminary CSM completed as part of the screening-level problem formation will be refined to include species-specific target receptors and identification of significant, insignificant, and incomplete pathways of exposure. Working hypotheses as well as questions for the additional site investigation to address will be identified in conjunction with refinement of the CSM.

5.6.3.2 Characterization of Exposure

The exposure characterization will identify the potential magnitude and frequency by, which target receptors are exposed to COPECs that have migrated through various pathways to terrestrial and aquatic habitats. In addition, the exposure characterization will identify all routes of exposure by which species inhabiting those areas may be exposed, and serves as input to the characterization of risk. The specific objectives of the characterization of exposure will be to:

- Select target receptors or communities that directly relate to assessment endpoints.
- Identify significant pathways/routes by which target receptors are potentially exposed.
- Predict exposure doses for selected target receptors.

5.6.3.2.1 Selection of Target Receptors and Communities and Routes of Exposure

Target receptors and communities will first be selected for evaluation in the screening ecological risk assessment. The selection of target receptors and communities will be based on the concept that it is neither feasible nor cost effective to measure contaminant effects on all species inhabiting terrestrial and aquatic systems. In addition, these systems are complex and ecological theory has not identified “aggregate” or “holistic” measures of system “health” or defined generic properties that are indicative of overall system status or integrity. Exposure pathways will be selected for each of the target receptors based on the assessment of the habitat types and

the patterns of chemical contamination and sensitivity. Emphasis will be given to those receptors or communities that have the greatest potential for exposure. Individual target receptors will only be selected for birds and mammals. Fish, benthic organisms, amphibians, reptiles, and plants will be evaluated as communities. When selecting communities for evaluation, receptor communities that are present in freshwater and marine systems will be evaluated separately.

All incomplete exposure pathways will be eliminated from consideration. For an exposure pathway to be complete, a contaminant must be able to travel from the source to the ecological receptor and to be taken up by the receptors via one or more exposure routes (TCEQ, 2001 and 2006). For terrestrial animals, there are three basic exposure routes: ingestion, inhalation, and dermal contact or absorption. Little information is available for quantifying the inhalation or dermal absorption exposure pathways for most wildlife. Although these exposure pathways may be complete, their risk is considered minimal when compared to dietary and incidental ingestion (TCEQ 2001 and 2006).

A list of species inhabiting or potentially inhabiting the site and areas adjacent to the site will be summarized in the risk assessment report. From this list of potential ecological receptors, habitat-specific target receptors will be chosen based on consideration of the following species-specific criteria:

- Species that potentially occur within the habitat to be evaluated.
- Species that represent a range of feeding relationships within each habitat.
- Species that are likely to be maximally exposed.
- Species that are critical to the structure and function of the particular ecosystem they inhabit.
- Species that are sensitive to the COPECs.
- Species that have a realistic and significant potential for exposure.
- Species for which sufficient exposure and toxicity data are available for evaluation.
- Species that are not threatened but similar to threatened or endangered species, and are of local concern.
 - Species will be phylogenetically related as closely as possible,
 - Species will be similar in habitat and diet as threatened or endangered species, and
 - Species will be as or more sensitive than threatened or endangered species, if at all possible

In addressing the sensitivity of species to the COPECs, it is important to note that for the screening-level risk assessment the toxicity data that will be used will be based on the most conservative values in the literature for the category of species (e.g., birds, small mammals) being evaluated. It is expected that the most sensitive species in the literature will typically be a function of the most frequently used experimental or test species. Thus, due to the limitations of the toxicity literature, the most conservative toxicity values for each chemical will be compared to the exposures for those species within the same phylogenetic class whose exposure is expected to be greatest at the site.

It is also important to note that even though target receptors will be selected for evaluation in the screening-level risk assessment, these species also represent the exposure that other similar species with comparable feeding habits may be receiving, and thus, serve as surrogate receptors.

Factors that will be considered in the exposure pathway selection include:

- Local topography.
- Local land use.
- Surrounding terrestrial habitat.
- Surrounding aquatic/wetland habitat.
- Availability of media-specific and location-specific data.
- Prediction of contaminant migration.
- Chemical characteristics of COPECs, including persistence and mobility.

These factors affect the selection of exposure pathways, since they determine the types and locations of ecological receptors and COPECs in the environment. The topography, land use, terrestrial habitat, and aquatic/wetland habitat in the site affect the type and locations of ecological receptors there. In addition, the characteristics of the COPECs and their potential for migration and uptake affect which media or tissues COPECs might be expected in, and thus would also affect exposure pathway selection.

5.6.3.2.2 Exposure Point Concentrations

Once the potential exposure pathways and affected habitats have been defined and the potential target receptors identified, points of likely exposure will be described. The chemical concentrations at these contact points (i.e., exposure point concentrations) are critical in determining exposure intake and subsequent risk to receptors. Exposure point concentrations may be developed for specific areas within the site or on a site-wide basis depending on the different terrestrial habitat available. This approach should facilitate prioritization of risk management decisions to specific portions of the site where ecological receptors may be more likely to occur. This would also help define the extent of any necessary ecological risk-based remediation.

Exposure point concentrations will be developed for the soil, taking into account potential 'hot spots' of contamination as well as availability of appropriate habitat. The hot spot evaluation shall also consider the magnitude of the chemical concentration as well as the habitat needs and home range of the receptor in question. In addition, area-specific or site-wide exposure point concentrations may be calculated based on the availability of terrestrial receptor habitat. The term "hot spot" describes a localized area where one or more chemicals occur in concentrations substantially (e.g., 2 or more orders of magnitude) greater than those found elsewhere at the site. The identification of hot spots will be determined on a case-by-case basis after thorough evaluation of both current and historical sampling data.

Potential impacts to ecological receptors will be assessed in the screening-level ecological risk assessment by first determining the availability of appropriate terrestrial habitat. Depending on the breakdown of appropriate habitat, two exposure point concentrations will be calculated; the maximum detected concentration and the 95% UCL concentration of the mean. If the 95% UCL concentration exceeds the maximum detected concentration for a chemical for a particular habitat area, the maximum detected concentration will be used as the exposure point concentration for that area. For those organisms that are stationary or are not very mobile (e.g., plants, soil invertebrates), the maximum detected concentration is generally applicable as the exposure point concentration. The 95% UCL concentration is most applicable to those organisms that are mobile and may be exposed to a larger portion of the site.

For those species with home ranges in excess of the site area, it would be plausible to evaluate aggregate risk of exposure based on a ratio of useable habitat area in their home range to useable habitat area within the site. An aggregate exposure point concentration would be calculated (i.e., 95% UCL) for species with extensive home ranges provided that COPEC distributions are fairly uniform within each of the site habitat areas, and that contamination, or lack of contamination, within the remainder of the species' home range is identified (i.e., ambient levels).

Exposure point concentrations will be developed for surface water and sediment in the site palustrine/estuarine wetlands and Redfish Bay.

Potential impacts to ecological receptors in the wetlands and bay will be evaluated in the ecological risk assessment using two exposure point concentrations for each wetland habitat type; the maximum detected and the 95% UCL concentrations. The maximum concentration is most applicable to those aquatic organisms that are not mobile (e.g., benthic macroinvertebrates) and may be exposed to a localized area. The 95% UCL is most applicable to those organisms that are mobile (e.g., fish, amphibians) and may be exposed to a larger portion of the wetlands and bay areas. If the 95% UCL concentration exceeds the maximum detected concentration for any chemical, only the maximum detected concentration will be used as the exposure point concentration.

Exposure point concentrations will be developed for on-site groundwater directly beneath the Site and for off-site groundwater down gradient of the Site.

If groundwater occurs at depths of less than 2 to 10 feet, potential impacts to plant target receptors from exposure to on-site groundwater will be evaluated using two exposure point concentrations; the maximum detected and the 95% UCL concentrations. If the 95% UCL concentration exceeds the maximum detected concentration for any chemical, only the maximum detected concentration will be used as the exposure point concentration.

With the exception of shallow groundwater that may provide a source to terrestrial vegetation, the groundwater is an incomplete ecological pathway unless there is a groundwater discharge to sediment and/or surface water. Potential impacts to aquatic receptors from off-site groundwater downgradient of the Site discharging to surface water will be also be conservatively evaluated

based on a completed groundwater to surface water pathway. It is assumed that aquatic receptors in Redfish bay may potentially be impacted by impacted groundwater, if the contaminant plume emanates into the bay. It is assumed that direction of groundwater flow is to the northeast from the Site towards and into the wetland areas and Redfish Bay. If the groundwater to surface water pathway is complete, two exposure point concentrations will be used to assess groundwater; the maximum detected and the 95% UCL. Again, if the 95% UCL concentration exceeds the maximum detected concentration for any chemical, only the maximum detected concentration will be used as the exposure point concentration. This exposure point concentration will be used to evaluate the total contribution of groundwater COPECs to the surface water taking into account the dilution of groundwater when it discharges to surface water.

In the case of groundwater contributing contaminants to sediment, this depends upon the existence of a plume and the COPECs involved and their chemistry and the media's chemistry (organic carbon, etc.) at the interface. In the screening assessment, groundwater concentrations will be evaluated as discussed previously, as will sediment concentrations. Should additional pore water data be required, then an additional sampling effort will be required to provide such data to evaluate the potential loading in the area of the release.

It is anticipated that many of the selected target receptors will be exposed through dietary intake (e.g., seeds, earthworms, fish, mammals). Since measured exposure point concentration data will not be available for dietary items, they will be predicted using uptake models. For example, an important exposure pathway for herbivorous terrestrial animals is the consumption of forage. The chemical concentrations in plants will be estimated by multiplying soil concentrations with chemical-specific plant uptake factors as available in the literature. Similar uptake models can be used to estimate chemical concentrations in other tissue types (e.g., earthworms, fish, mammals), and will be dependent on the target receptors selected for evaluation in the risk assessment.

5.6.3.2.3 Estimation of Exposure Doses

Once exposure point concentrations have been determined, daily exposure for target receptors will be estimated using conservative exposure parameters for each receptor. For target receptors or communities that are exposed directly to the media in which they live (e.g., aquatic organisms, plants), exposure will be expressed in terms of measured concentrations of contaminants in the media (e.g., water). For organisms exposed via the ingestion pathway, exposure dose models will be developed which express exposure in terms of contaminant intake per kilogram of body weight per day (mg/kg-day). These models will incorporate information on exposure frequency, exposure point concentrations, body weights, and ingestion rates.

To predict exposure to a chemical by a target receptor, exposure needs to be evaluated through each complete exposure pathway. The exposure algorithm for estimating daily intake through the ingestion exposure route can be generically described as:

$$EDI = C_{medium} \times IR \times FI$$

Where:

- EDI = Estimated daily intake to a chemical through an exposure route (mg/kg-day).
 C_{medium} = Concentration of contaminant in a particular medium (mg/kg or mg/L).
 IR = Ingestion rate of medium by receptor, normalized for body weight (mg/kg BW-day or L/kg BW-day).
 FI = Fraction ingested from contaminated source (unitless).

Total exposure of a target receptor from ingesting contaminated food, soil, sediment, and water can be generically described as:

$$EDI_{total} = EDI_{soil} + EDI_{sediment} + EDI_{water} + EDI_{food}$$

Where:

- EDI_{total} = Total exposure dose (mg/kg-day).
 EDI_{soil} = Estimated daily intake of contaminant via soil (mg/kg-day).
 $EDI_{sediment}$ = Estimated daily intake of contaminant via sediment (mg/kg-day).
 EDI_{water} = Estimated daily intake of contaminant via water (mg/kg-day).
 EDI_{food} = Estimated daily intake of contaminant via food, either forage or prey (mg/kg-day).

While dermal contact and inhalation are possible contaminant uptake routes, little information is available for quantifying these exposure pathways for wildlife when compared to the availability of information for quantifying ingestion (TNRCC, 1996). Assumptions for each of the required exposure parameters will be based on literature as well as site-specific information. Exposure parameters that will be needed as part of the quantification of ingestion are as follows:

- Area use factor (unitless percent)
- Migration factor (unitless percent)
- Bioavailability (unitless percent)
- Most sensitive life stage
- Body weight and ingestion rates
- Fraction of contaminated dietary component (unitless percent)

5.6.3.3 Characterization of Ecological Effects

In the ecological effects characterization, information on the toxicity of the COPECs to ecological species will be presented. Toxicity information will be used to develop toxicity reference values (TRVs) for selected target receptors or communities. TRVs represent NOAELs as doses or media concentrations. For some chemicals, the TRVs are true NOAELs and for other chemicals, TRVs are developed as NOAELs using available toxicity information and extrapolation factors.

5.6.3.3.1 Literature Review of Toxicity Data

The toxicity of each COPEC will be assessed for aquatic life, terrestrial wildlife, amphibian and reptilian wildlife, and vegetation, where relevant. Scientific literature and regulatory guidelines will be reviewed for media-specific and species-specific toxicity data. Sources of criteria and toxicity data for the ecological assessment include the following:

- Federal/State Regulations and Guidance
- AWQC
- AQUIRE database
- SETAC Database for Aquatic Organisms: Tissue Residues
- PHYTOTOX database
- TERRETOX database
- ENVIROFATE database
- HSDB
- ORNL RAIS
- Registry of Toxic Effects of Chemical Substances (RTECs)
- IRIS - (non gavage studies)
- U.S. Fish and Wildlife Service Technical Reports (Eisler)

If necessary, toxicity information will also be obtained from a variety of peer-reviewed primary literature sources.

5.6.3.3.2 Derivation of Reference Toxicity Values

For most constituents, several sources will be reviewed to derive TRVs. Studies obtained from these sources provide exposure data associated with a variety of toxicity endpoints (i.e., LOAEL, NOAEL, median lethal dose (LD₅₀)) and effects (i.e., neurotoxicity, developmental toxicity, death). The toxicity values used in the assessment will be those that exhibit the lowest exposure doses reported to be toxic or the highest doses associated with no adverse effects. The process of selecting an appropriate toxicity endpoint for use in the TRV derivation requires guidelines for determining the appropriateness of specific endpoints. In general, effects that have apparent ecological implications will be preferentially used. Thus, preference will be given to endpoints such as reproductive effects (e.g., decreased fertility, teratogenicity, developmental effects and fetal re-absorption) and mortality of adults or offspring, both of which would impact the species population. Preference will also be given to serious histopathological effects (necrosis or other damage to target organs tissues: liver, kidney, brain/central nervous system, lungs, stomach, pancreas, etc.) that would impact primary body functions. In the absence of these preferred data, consideration will also be given to effects such as alteration in biochemical functions of organs that could be correlated with decreased survivability (e.g., acetylcholinesterase function), as well as alteration in normal behavior that may result in decreased survivability of a receptor (e.g.,

impaired motor skills, increased reaction time, altered feeding habits). Other types of effects data such as increased body weight, decreased liver size, increased blood lead, which are not readily associated with decreased survivability or longevity, will only be used in the absence of preferred toxicity data.

In addition, care will be taken in those cases involving threatened and endangered species to find NOAEL's that afford additional protection, and if possible documented protection, otherwise appropriate safety factors will be applied to achieve said protection (see below).

Carcinogenicity endpoints are not considered appropriate for derivation of TRVs, since a number of factors confound the extrapolation of carcinogenicity data between species of the same phylogenetic class. These factors include:

- The no-threshold assumption for carcinogens precludes the extrapolation of a TRV to a chronic no-observable effect level.
- Carcinogenic studies with laboratory animals often require high doses to generate tumors within the lifetime of the study and/or test species. The latency period for tumor induction is potentially greater than the lifetime of the ecological receptor of concern due to lower levels of exposure an organism would receive in the field.
- The inbred origins of many laboratory animals do not necessarily reflect the outbred species that would be expected to occupy the site. Within a given species there are also significant differences between individuals in their abilities to bioactivate and deactivate carcinogenic molecules. Factors such as age, sex, genetic makeup, and nutritional disposition contribute to uncertainty (Travis, 1988).

In deriving TRVs, data for chronic toxicity will be preferentially used, when available. The resulting TRV will thus protect for chronic effects. Chronic exposure has been defined by Suter et al. (1983) as an extended exposure of an organism to a chemical, which is conventionally taken to include at least a tenth of the life span of the species. Although chronic studies, as defined here, will be preferentially used in the assessment, some studies may fall into a subchronic category, in which the length of the study extends less than a tenth of the lifespan, but longer than what would be considered an acute exposure. Acute exposure is defined in this assessment as a brief exposure to a chemical, which refers to an instantaneous exposure (e.g., oral gavage) or continuous exposures of minutes to a few days (Suter, 1993). In the absence of chronic and subchronic data, TRVs will be derived based on available acute or sub-chronic data (as available), and extrapolated to a chronic no effect level.

A number of extrapolation factors will be used to develop TRVs for test species that are protective of target receptors at the site. Where only acute lethal toxicity values are available, TRVs will be derived by dividing acute toxicity values by an appropriate extrapolation factor. As recommended by EPA Region 6, a median lethal dose (LD₅₀) will be extrapolated to a chronic LOAEL by dividing the LD₅₀ by a factor of 10. Lewis et al. (1990) determined chemical-specific ratios between LD₅₀ values and NOAELs for the same species in a total of 490 studies. The results of the evaluation by Lewis et al. indicated that a factor of 6 was adequate to protect 99.9

percent of the populations for 85 percent of all evaluated chemicals. Thus, dividing an LD₅₀ by a factor of ten to extrapolate to a chronic LOAEL should be adequately protective.

EPA recommends a factor of 10 when extrapolating from a chronic LOAEL to a chronic NOAEL (EPA, 1997). Weil and McCollister (1963) evaluated ratios of LOAELs to NOAELs from both subchronic and chronic studies for laboratory animals (Lewis et al. 1990). Approximately 96% of the studies (50 of 52) resulted in ratios of less than or equal to 5. Thus, a factor of 10 is adequately protective in extrapolating from a chronic or sub-chronic LOAEL to a chronic NOAEL.

Toxicity data for aquatic organisms, amphibians and reptiles, and plants are typically expressed in terms of media concentrations (e.g., AWQC, sediment and soil concentrations) rather than as a dose. These values will be directly compared to site-specific media concentrations, with no application of extrapolation factors, except if species-specific aquatic TRVs need to be derived. In this specific case, extrapolation factors have been proposed by Suter et al. (1983) and Mayer et al. (1986), and will be used in this assessment. LOAELs will be extrapolated to NOAELs by dividing by 10, as indicated below. For ecotoxicity values used in this assessment that were obtained from ORNL databases, only original values will be used. The 20% adjustment factor typically used by ORNL will not be applied.

Therefore, the safety factors include:

- Acute to Chronic LOAEL: divide by 10.
- Sub-chronic LOAEL to Chronic NOAEL: divide by 10.
- Chronic LOAEL to Chronic NOAEL: divide by 10.
- If the test organism is within the same class and order the factor of 10 will be decreased to a factor of 5.
- If a chain of safety factors are used, they will be multiplied together first, and then the starting end point divided by the resultant to achieve the necessary TRV.

5.6.4 Study Design and Data Quality Objectives Process – Step 4

The study design and DQO process step of the BERA will establish the measurement endpoints, which complete refinement of the CSM in Step 3. The CSM will then be used to develop the study design and DQOs. The BERA Work Plan and the SAP, which will describe the details of the site investigation as well as the data analysis methods and the DQOs. The BERA Work Plan will describe the assessment endpoints, exposure pathways, questions and testable hypotheses, measurement endpoints and their relation to assessment endpoints, and uncertainties and assumptions. The SAP will describe data needs; scientifically valid and sufficient study design and data analysis procedures; study methodology and protocols, including sampling techniques' data reduction and interpretation techniques, including statistical analyses' and quality assurance procedures and quality control techniques.

A Draft BERA Work Plan and a Draft SAP will be developed and submitted to EPA for review and approval according to the schedule specified in the Final RI/FS Work Plan. An Amended Draft BERA Work Plan and an Amended Draft SAP will be submitted to EPA within 30

calendar days of the receipt of their comments related to the associated draft documents. The Final BERA Work Plan and the Final SAP will be submitted to EPA within 14 calendar days of the receipt of their comments related to the associated amended draft documents.

5.6.5 Field Verification of Sampling Design – Step 5

The field verification of sampling design step of the BERA process will ensure that the DQOs for the site can be met. During this step, the site appropriateness and implementability of the selected assessment endpoints, testable hypotheses, exposure pathway model, measurement endpoints, and study design from Steps 3 and 4 will be verified. This step will be completed as part of finalizing the BERA Work Plan and SAP. The Final BERA Work Plan and Final SAP must be approved by EPA prior to implementation the site investigation and analysis phase (Step 6).

5.6.6 Site Investigation – Step 6

During this step, site investigation and analysis activities will be implemented as detailed in and in accordance with the BERA Work Plan and the SAP. The results of the site investigation and analysis will be utilized to characterize the ecological risks (Step 7).

The Final BERA Work Plan for the site investigation activities will be based on the CSM and will specify the assessment endpoints, risk questions, and testable hypotheses. All DQOs and requirements for co-located samples will be adhered to in accordance with the BERA Work Plan during the site investigation.

During the analysis phase of the BERA process, all data will be technically evaluated on the existing and potential exposures and ecological effects at the site. The analysis will be based on the information collected during Steps 1 through 5 and will include additional assumptions or model to interpret the data in the context of the CSM. The SAP will be revised as required by changes in field conditions and/or new information on the nature and extent of contamination at the site.

5.6.7 Risk Characterization – Step 7

The risk characterization will be the final phase of the BERA process and will include risk estimation and description. The risk characterization will integrate information from the problem formulation and the exposure and ecological effects characterizations to estimate the nature and extent of ecological risk or threat, and the environmental impact from site activities. The ecological risk characterization will be based on a weight-of-evidence approach, where multiple lines of evidence will be presented and evaluated.

At the completion of risk characterization, a Draft BERA Report will be prepared and submitted to EPA for review and approval in accordance with the schedule identified in the Final RI/FS Work Plan. An Amended Draft BERA Report will be submitted to EPA within 45 calendar days

of receipt of their comments related to the Draft BERA Report. The Final BERA will be submitted to EPA within 30 calendar days of receipt of their comments related to the Amended Draft BERA Report.

The following tasks will be completed as part of the risk characterization step.

5.6.7.1 Hazard Quotient Method

The potential risk posed to ecological receptors will be assessed by comparing estimated daily doses or media-specific concentrations with TRVs. This comparison, described as a HQ, will be made for each chemical and is expressed as shown below. Exposures to the same chemical through multiple exposure routes (e.g., ingestion of water, ingestion of prey) are assumed to be cumulative within the calculation of the HQ.

$$HQ = C_{\text{med}} / \text{TRV}_{\text{med}}$$

Where:

- C_{med} = Concentration of a chemical in a medium (mg/kg or mg/L).
 TRV_{med} = Toxicity reference value for the same chemical in the same medium (mg/kg or mg/L).

or:

$$HQ = \text{Dose}_{\text{total}} / \text{TRV}_{\text{ing}}$$

Where:

- $\text{Dose}_{\text{total}}$ = Estimated daily dose of a chemical through all exposure routes and/or sources (i.e., soil, water, or food ingestion) (mg/kg-day).
 TRV_{ing} = Toxicity reference value for the same chemical through the ingestion route (mg/kg-day).

If the calculated screening HQ exceeds unity (i.e., >1), then it simply indicates that the species of concern may be at risk to an adverse effect from that chemical through that exposure route. Because TRVs incorporate a number of extrapolation factors, if TRV is exceeded (i.e., the HQ exceeds unity), it does not necessarily indicate that an adverse effect will occur. Further evaluation (e.g., empirical field studies) may be needed for those chemicals with a screening HQ that exceeds one.

For chemicals acting via similar mechanisms, a Hazard Index (HI) will be determined to evaluate the potential accumulative risk posed by a set of chemicals with similar toxicological properties for that organism as follows:

$$HI_{\text{receptor}} = HQ_{\text{COPEC 1}} + HQ_{\text{COPEC 2}}$$

Where:

- HI_{receptor} = Hazard index for a measurement receptor.
 $HQ_{\text{COPEC 1}}$ = Hazard quotient for that measurement receptor due to COPEC 1.
 $HQ_{\text{route 2}}$ = Hazard quotient for that measurement receptor due to COPEC 2.

Because different chemicals affect different target organs through various mechanisms, HQs for different chemicals may not always be additive. Therefore, the risk characterization will consider summing multiple HI values (for different toxic mechanisms) in those case where the values are all less than but approach unity, and may exceed it if added. This provides the risk analysis with the ability of evaluating all chemicals across all sources/exposures and across different toxic mechanisms in order to fully consider the cumulative hazard to a particular receptor.

5.6.7.2 Site Investigation and Analysis of Exposure and Effects

The necessity for site-specific field studies will be evaluated by medium. There are a limited number of approaches currently available for conducting site-specific field investigations. These are: (1) bioaccumulation and field tissue residue studies; (2) population/community evaluations; and (3) toxicity testing (EPA, 1997). In determining the need and scope of field studies, the goals and impacts of testing will first be identified. The primary goal of field studies will be to reduce uncertainty in the ecological risk assessment modeling and to provide supporting information for any remedial measures, should they be required. Site-specific field studies may be necessary as part of a definitive ecological risk assessment (Steps 3 through 8 in Figure 16) if any one of the following criteria are met:

- A total HI exceeds one for any assessment endpoint.
- Exceedance of guidance values or criteria for media-based contamination (e.g., sediments).
- Identified receptor of concern (i.e., assessment endpoint) for which the lack of appropriate uptake algorithms precludes a complete exposure assessment.
- Insufficient toxicity data are available for assessment of potential impact.
- Associated uncertainty with modeling assumptions limits the effectiveness of the Hazard Quotient approach.

The need for site-specific field studies will be determined after review of the hazard quotient method results presented in the screening ecological risk assessment, and in consultation with the EPA. Any field studies, which may be selected should be relevant to the assessment endpoints that have been identified. Following is a brief discussion of the types of field studies that may be considered for the site.

5.6.7.2.1 Bioaccumulation and Field Tissue Residue Studies

Tissue residue studies can be performed to measure contaminant concentration in foods consumed by the target receptors associated with the selected assessment endpoints for the ecological risk assessment. This reduces the uncertainties associated with modeling potential exposures to selected target receptors. Types of residue studies that may be considered for future ecological risk assessment work at the Site include earthworm and fish tissue residue studies (EPA, 1997), including sediment invertebrate residue studies for invertebrates in the wetlands or Intracoastal Waterway/Redfish Bay.

5.6.7.2.2 Population / Community Evaluations

Population and community surveys evaluate the current status of an ecosystem, and can incorporate several measures of population or community structure or function. The most commonly used measures include number of species and abundance of organisms in an ecosystem. Some types of population/community evaluations that are performed at ecological sites include benthic macroinvertebrate surveys, fish community evaluations, and terrestrial plant community evaluations. Benthic macroinvertebrate surveys are the most common population/community evaluations conducted. Such studies are useful for evaluating the impacts of a contaminant already released into the environment. Although population/community studies can provide valuable information, there are often many confounding factors (e.g., natural population fluctuations in relation to population density and food availability) that need to be considered in interpreting results (EPA, 1997).

5.6.7.2.3 Toxicity Tests

Toxicity tests are used to directly evaluate the bioavailability and toxicity of site contaminants to selected test organisms (EPA, 1997). In toxicity tests, test organisms are exposed to a medium from site-specific groundwater, surface water, sediment, or soil in order to evaluate the effects of contamination on the survival, growth, reproduction, behavior, and/or other attributes of these organisms. Usually the studies are performed in a laboratory, but they may also be conducted on-site (*i.e.*, in situ tests). These tests help to determine whether contaminant concentrations in media at the site are high enough to cause adverse effects in organisms. Tests can either be acute or chronic. Acute tests last a short time, generally 4 days or less and mortality is the response measured. Chronic tests are used to study the effect of continuous, long-term exposure (about 1/10th of an organisms lifespan or more), which generally evaluates sublethal effects (EPA, 1994b). Types of toxicity tests that may be considered for the site include soil toxicity to earthworms (e.g., survival, growth, reproduction), soil toxicity to plants (e.g., germination, root elongation, biomass), sediment toxicity to invertebrates (e.g., survival, growth), surface water toxicity to daphnia or fish (e.g., survival, growth, reproduction), and sediment or surface water toxicity to amphibians (e.g. frog embryo teratogenesis assay (FETAX)).

5.6.7.3 Uncertainty Analysis

As with the human health risk assessment, there are many uncertainties associated with estimating exposure and risks to ecological organisms. The uncertainty analysis will address the major assumptions that affect the degree of confidence in the estimate of risk. Variables such as exposure locations, strength of the exposure assumptions used in calculating doses, and the strength of the toxicological evidence supporting the toxicity values, will be evaluated in the uncertainty analysis. Quantitative measures of uncertainty will be conducted for potential cumulative risk to those inorganic chemicals that were screened out of the risk assessment using background comparisons.

5.6.8 Risk Management – Step 8

The responsibilities for the risk management at the site include the balancing of risk reductions associated with cleanup of contaminants with potential impacts of the remedial action themselves. The threshold for effects on the assessment endpoint as a range between contamination levels identified as posing no ecological risk and the lowest contamination levels identified as likely to produce adverse ecological effects will be identified in Step 7. The Remedial Project Manager will evaluate several factors in deciding whether or not to clean up to that range during Step 8. This risk management decision will be finalized by the EPA in the Record of Decision for the site.

5.7 Treatability Study

This Treatability Study (TS) Work Plan provides an overview of the methods to be used if a TS is conducted. As site information and remedial alternatives are developed for the site, the need for additional data to evaluate technology performance may be identified. This data need will determine whether or not a TS will be required for the site.

5.7.1 Objectives of the Treatability Study

The primary objectives of a TS include:

- Provide sufficient data to allow treatment alternatives to be fully developed and evaluated during the detailed analysis, and to support the remedial design of a selected alternative.
- Reduce cost and performance uncertainties for treatment alternatives to acceptable levels so that a remedy can be selected

5.7.2 Determination of Candidate Technologies and Need for Testing

During the site characterization and remedial alternative development phases of the RI/FS, potential candidate technologies for a TS program will be identified. These potential candidate technologies for TS will cover the range of technologies required for alternatives analysis.

Determination of the candidate technologies for TS will be begin with a literature survey that will be preformed to gather information for the following reasons:

- To determine whether the performance of the technologies under consideration have been sufficiently documented on similar wastes consider the scale and the number of times the technologies have been used.
- To gather information on relative costs, applicability, removal efficiencies, operation and maintenance requirements, and implementability on the candidate technologies.
- To determine testing requirements for bench or pilot studies, if required.

If the results of the literature survey indicate that the candidate technologies that address the site conditions have not been sufficiently demonstrated or cannot be adequately evaluated for the site on the basis of available information, treatability testing may be required.

In general, treatability testing is not necessary when:

- The data indicate that the technologies have been demonstrated sufficiently so the site-specific information collected during the site characterization is adequate to evaluate and cost those technologies.
- The technology is well developed and proven on similar applications.
- Substantial experience exists with a technology employing treatment of well-documented waste materials.
- Relatively low removal efficiencies are required.

A Draft Candidate Technologies Technical Memorandum (CTTM) will be prepared that includes a listing and justification of the candidate technologies for TS. The Draft CTTM will be submitted to EPA for review and approval according to the project schedule specified in the Final RI/FS Work Plan. An amended Draft CTTM will be prepared and submitted within 30 calendar days of receipt of the EPA's comments related to the Draft CTTM. A Final CTTM will be prepared and submitted within 14 calendar days of receipt of the EPA's comments related to the Amended Draft CTTM. The CTTM will include not only a listing of the candidate technologies for TS, but also the specific data requirements for the testing program that have been determined and refined during the characterization of the site and the development and screening of remedial alternatives.

Where it is determined by EPA that treatability testing is required, and unless it cannot be demonstrated to EPA's satisfaction that treatability testing is not needed, TSs will be performed, as outlined in the following section, including the preparation of a TS Work Plan.

5.7.3 Treatability Studies

If necessary, the treatability studies performed during the RI/FS is used to adequately evaluate a specific technology, to determine the suitability of the remedial technologies to site conditions and problems, and to adequately estimate cost and performance capabilities of a technology.

If the need for a treatability study is determined, additional literature review with supporting documents supporting the treatability study will be submitted as an attachment to the Alternative Development and Screening Technical Memorandum. The literature review should cover the performance, relative costs, applicability, removal efficiencies, operation and maintenance (O&M) requirements, and implementability of the remedial technologies. Additional review should be conducted to research parameters that impact treatability and compare these parameters to site characteristics. A TS may be needed for a remedial technology that has not been sufficiently demonstrated, or cannot be adequately evaluated, on the basis of available information.

If a treatability study is determined necessary, it will include the following steps:

- Preparation of a TS Work Plan for the bench or pilot studies.
- Performance of the field sampling, and/or bench testing, and/or pilot testing.
- Evaluation of data from the field studies, and/or bench testing and/or pilot testing.
- Preparation of a report documenting the results of the testing.

5.7.3.1 Bench Scale and Pilot Scale Studies

Once a decision has been made to perform TSs, the scale of treatability investigations of study (technology-specific bench scale studies and pilot scale studies) will be determined with concurrence from EPA. The decision to perform pilot testing will be made as early in the RI/FS process as possible to minimize potential delays of the FS because of the time required to design, fabricate, and install the required equipment. Whether bench scale or pilot scale testing will be performed will be determined with concurrence from EPA based upon:

- The level of development of the technology (bench scale testing is often appropriate for fully development technologies).
- The scale of the technology (bench scale testing may not be appropriate because of the physical size of the technology equipment).
- Schedule requirements.
- Cost versus benefit of type of generated data.

5.7.3.1.1 Bench Scale Testing

If a bench scale TS is conducted, it will most likely be conducted with small volumes of site waste being tested for the individual parameters of a treatment technology. The generated data will then be extrapolated to a full scale system appropriate for the site. If a bench scale study is performed, care will be taken in attempting to predict the performance of full-scale processes on the basis of the small scale tests.

Potential objectives of bench scale testing include:

- Effectiveness of the treatment alternative on the waste.
- Differences in performance between competing manufacturers.
- Differences in performance between alternative chemicals.
- Sizing requirements for pilot-scale studies.
- Screening of technologies to be pilot tested.
- Sizing of those treatment units that would sufficiently affect the cost of implementing the technology.
- Compatibility of materials with the waste.

Preplanning information that will be gathered prior to initiating bench scale studies includes:

- A waste sampling plan.
- Waste characterization.
- Treatment goals.
- Data requirement for estimating the cost of the technology being evaluated.
- Information related to the necessary equipment and services for the study.

5.7.3.1.2 Pilot Scale Testing

If pilot scale studies are performed, the pilot unit will be designed as small as possible to minimize cost, but large enough to generate the data required for scaling to full size unit. A larger volume of site waste will be required than for a bench scale study. The objective of a pilot scale test is to simulate the physical as well as chemical parameters of the full-scale process.

In addition to the preplanning information gathered for bench scale studies, the following will also be determined:

- Site information that would affect pilot-test requirements.
- Waste requirements for testing.

- Data requirement for technologies to be tested.

If the TS includes pilot scale testing, these activities will be initiated as early as possible to minimize potential delays in the FS.

5.7.3.2 Treatability Study Work Plan

A TS Work Plan will be prepared to delineate the objectives and scope of the TS. In general, the TS Work Plan will include the following:

- An explanation of the reasons for conducting the study and the objectives of the study, being attentive to consider chemical decontamination, materials handling, physical properties, and incidental waste stream issues which may be pertinent to the full scale implementation of the technology.
- An explanation of why the proposed scale of the study (bench or pilot) is appropriate to meet the objectives of the study.
- A detailed description of how the study will be conducted including a detailed description of each step of the study, equipment to be used, instrumentation and laboratory analysis methods, adjustments anticipated to be made during the study and all other information necessary to describe how the study will meet the study objectives. The study description will be made in the context of consideration of eventual full scale implementation and will address how scale differences between the study and full scale implementation will be considered and addressed in making recommendations about full scale implementability of the technology.
- A discussion of the material from the site to be subjected to the study, including how the selection of material is to address issues of site variability, how the technology being studied may be sensitive to site variances, how field sample selection is to be made to address variability and representativeness concerns, how samples are to be prepared (both during collection and as a part of the pretest sample handling), how sample preparation for the study may vary from material preparation during full scale implementation, and how differences between sample preparation for the study and material handling during full scale implementation may affect the validity of conclusions drawn as a result of the study.
- A discussion of the level of QA and QC that is appropriate in regard to data generated as a part of the study will be implemented.
- A discussion about how data from the study will be evaluated and presented to achieve the objectives of the study.
- An outline of the TS Report, which will be prepared to present the findings of the study.
- A schedule and cost estimate to conduct the study, including field sample collection and preparation of other appropriate required supporting plans such as FSP, HSP, and QAPP.

Because of the variations in bench scale and pilot scale testing programs, the format of the plans for each type of study that fulfills the requirements of the TS Work Plan listed above will vary.

5.7.3.2.1 Bench Scale Treatability Study Work Plan Outline

If the TS includes bench scale studies, the TS Work Plan will be prepared in the format of the following outline:

- Project Description and Site Background.
- Remediation Technology Description.
- Test Objectives.
- Specialized Equipment and Materials.
- Laboratory Test Procedures.
- Treatability Test Plan Matrix and Parameters to Measure.
- Analytical Methods.
- Data Management.
- Data Analysis and Interpretation.
- Health and Safety.
- Residuals Management.

5.7.3.2.2 Pilot Scale Treatability Study Work Plan Outline

If the TS includes pilot scale studies, the TS Work Plan will be prepared in the format of the following outline:

- Project Description and Site Background.
- Remediation Technology Description.
- Test Objectives.
- Pilot Plant Installation and Startup.
- Pilot Plant O&M Procedures.
- Parameters to be Tested.
- Sampling Plan.
- Analytical Methods.
- Data Management.
- Data Analysis and Interpretation.

- Health and Safety.
- Residuals Management.

5.7.4 Treatability Study Work Plan Deliverables

A Draft TS Work Plan will be prepared and submitted to EPA for review 60 days after the receipt of the EPA's notice that TS are required. In addition, a Draft SAP and a Draft HSP for the TS will also be prepared and submitted to EPA at the same time. An Amended Draft TS Work Plan, Amended Draft SAP and Amended Draft HSP will be submitted to EPA within 30 days of receipt of the EPA's comments on the draft documents. A Final TS Work Plan, SAP and HSP will be submitted to EPA within 14 days of receipt of the EPA's comments on the amended draft documents.

5.7.5 Treatability Study Report

Upon completion of the TS, a TS Report shall be submitted to EPA. This report will evaluate the technology's effectiveness and implementability in relation to the remedial goals established for the site. In addition, actual results will be compared with predicted results to justify the effectiveness and implementability discussions detailing the results. The TS Report will include (as applicable):

- A description of the remedial technology being studied;
- A description of the test objectives;
- A detailed description of each step of the study from sample collection through data evaluation, highlighting any deviations from the TS Plan and discussing how those deviations may have affected meeting the test objectives or making valid conclusions about the suitability or implementability of the technology for the project;
- Data management and analysis;
- Health and safety.
- Residual waste management
- A detailed presentation of conclusions (including how each test objective was or was not achieved) and recommendations relating to the suitability of the technology to meet the full-scale objectives of the project. The discussion will address factors, which may affect the successful full-scale implementation of the technology, and how those factors can be mitigated during full-scale implementation. The report will include recommendations about how to procure, specify, and compensate the future contractor for implementation of the full-scale technology to maximize the opportunity for successful completion of the project, and
- An executive summary describing the objectives and major conclusions and recommendations of the study.

The Draft TS Report will be prepared and submitted according to the schedule identified in the Final TS Work Plan. An Amended Draft TS Report will be submitted within 45 calendar days of receipt of the EPA's comments related to the Draft TS Report. A Final TS Report will be submitted within 30 calendar days of receipt of the EPA's comments on the Amended Draft TS Report.

5.8 Feasibility Workplan

This FS Work Plan (Plan) provides an overview of the methods that will be used in conducting the FS for the site. The Plan will present the objectives and methodology of the FS and a schedule for completion of the FS.

5.8.1 Feasibility Study Objectives

The objectives of the FS are to develop and evaluate remedial alternatives in order to allow selection of appropriate remedial actions for the site. The FS will be conducted to meet the objectives set forth in the NCP [NCP 40 CFR 300.430 30 (e)] and in accordance with the EPA guidance document, Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final, October 1988 (RI/FS Guidance Document), and/or other applicable guidance documents.

5.8.1.1 Phases of the Feasibility Study

In accordance with guidance, the FS process occurs in three phases: the development of alternatives, the screening of alternatives, and the detailed analysis of alternatives. In practice, the point at which the development phase ends and the screening phase begins is generally not distinct. Therefore, this Plan will combine the first two phases (development and screening of alternatives) to reflect the interrelatedness of these efforts.

In the alternative development and screening phase, an appropriate range of remedial options will be developed. These alternatives will be developed concurrently with the RI site characterization in an iterative manner. The tasks that will be completed during the alternative development and screening phase for the site are identified in Section 5.8.2.

The detailed analysis of alternatives will consist of analysis and presentation of the relevant information that will be used to select the remedy(s) for the site. The results of the analysis will be prepared so that an objective comparison can be made between alternatives, and the key advantages and disadvantages of the alternatives are identified. The tasks that will be completed during the detailed analysis of alternatives for the site are provided in Section 5.8.3.

At the conclusion of the FS process, sufficient information will be available to adequately compare the alternatives so that the appropriate remedy for the site can be selected.

5.8.2 Development and Screening of Alternatives

Alternatives for remediation will be developed by assembling appropriate combinations of technologies, and the media to which they will be applied, into alternatives that address the site contamination. Appropriate remedial options will include those that ensure the protection of human health and the environment. This alternative development consists of seven general steps:

- Develop remedial action objectives that specify contaminants and media of interest, exposure pathways, and remediation goals.
- Develop general response actions for each medium of interest that define the activity that may be taken to achieve the remedial action objectives.
- Identify the volumes or areas of media that will be treated by the general response actions, based on the remedial action objectives and the chemical and physical site characterization.
- Identify and screen the technologies applicable to each general response action to identify those that can and cannot be implemented technically at the site.
- Identify, evaluate, and select a representative process for each technology type that has been retained for consideration during the previous step.
- Assemble the selected representative technologies into alternatives representing a range of remedial actions.
- Screen the representative alternatives.

An Alternative Development and Screening Technical Memorandum (ADSM) will be prepared that will summarize the results of these tasks. This memorandum will be submitted for approval in accordance with the schedule. The tasks that will be implemented for each of these steps are detailed in the following sections.

5.8.2.1 Task 1 – Develop Remedial Action Objectives

Remedial action objectives that consist of medium-specific or operable unit-specific goals for protecting human health and the environment will be developed. The site-specific remedial action objectives will identify:

- Contaminants of concern for each affected medium (or unit).
- Potential exposure pathways and receptors.
- Preliminary remediation goals for the site that establish acceptable contaminant levels, or range of levels, for each exposure route and that are protective of public health and the environment.

The remedial action objectives will define both a contaminant level and an exposure route because protectiveness may be achieved by reducing exposure alone, or in combination with reducing contaminant levels.

Preliminary development of the remediation goals will be based on frequently used medium-specific exposure standards, including Applicable or Relevant and Appropriate Requirements (ARARs). However, the final remediation goals, specifically the acceptable exposure levels, will be determined based upon the results of the human health and ecological baseline risk assessments for the site and on the evaluation of the expected exposure and associated risks for each remedial alternative. Contaminant levels in each medium will be compared with these acceptable levels to ensure the following:

- The remediation goals for all carcinogens of concern will be within the acceptable risk range of 1.0×10^{-4} to 1.0×10^{-6} , or the probability of one in 10,000 to one in 1,000,000 individuals developing cancer as a result of site-related contaminants, respectively.
- The remediation goals for all non-carcinogens of concern are sufficiently protective.
- The human health and environmental effects are adequately addressed.
- The exposure analysis conducted as part of the risk assessments adequately address each significant pathway of exposure identified in the baseline risk assessments.

5.8.2.2 Task 2 – Develop General Response Actions

Medium specific, general response actions will be developed that describe actions that will satisfy the remedial action objectives. Potential media to be addressed include surface and subsurface soils, sediment, surface water, and groundwater. The contents of the tanks and piping leading from the North Site to the historical and current docking areas will be addressed by the ongoing Removal action and the planned Remedial Action.

Potential general response actions for the site may include treatment, containment, excavation, extraction, disposal, institutional controls, or a combination of these options. Combinations of general response actions may be defined to address the various media, in particular when actions are interdependent (i.e., when disposal methods primarily depend on whether the medium has been previously treated).

The general response actions will be initially defined during the initial RI phase and will be refined throughout the remainder of the RI/FS process as understanding of site conditions and action-specific remedial objectives are refined.

5.8.2.3 Task 3 – Identify Volumes or Areas of Media

During the development of alternatives, initial estimates will be made of areas or volumes of each media of interest at the site to which the general response actions could apply. These estimates will be refined to take into account potential interactions of various media indicated by

the nature of the general response actions. Careful judgment will be utilized when defining the areas or volumes of media and acceptable exposure levels and potential exposure routes, site conditions, and the nature and extent of contamination.

5.8.2.4 Task 4 – Identify and Screen Remedial Technologies and Process Options

During this task, potentially applicable technology types and process options will be identified for each general response action. Only remediation technologies that are applicable to the contaminants present, their physical matrix, and other site characteristics will be evaluated. Technology types refer to general categories of technologies, such as chemical treatment, immobilization, capping, or extraction. Technology processes refer to specific processes within each technology type, such as chemical treatment process technologies could include precipitation, ion exchange and oxidation/reduction. The number of technology types and process options will then be reduced by evaluating the options, with respect to technical implementability. Technology types and process options will be identified based on experience, literature sources, and standard engineering practices as applicable to site conditions.

During screening, process options and entire technology types will be retained, or eliminated from further consideration, on the basis of technical implementability. This screening will use readily available information from the RI site characterization. Specifically, information on contaminant types, concentrations, and on-site characteristics will be utilized to screen out technologies and process options that cannot be effectively implemented.

The remedial technologies and process options screening process will be documented, and this documentation will be provided in the RI/FS report.

5.8.2.5 Task 5 – Evaluate Process Options

Representative processes for each technology type will be selected to simplify the subsequent development and evaluation of alternatives, without limiting the flexibility during remedial design. During this process evaluation step, technology processes still under consideration will be evaluated in greater detail, so that the most appropriate process for each technology type can be selected. The selected processes will provide a basis for developing performance specifications during the preliminary design even though the specific processes actually implemented during the remedial actions at the site may not be selected until the remedial design phase. An attempt will be made to select one representative process for each technology type. However, more than one process may be selected if they all are sufficiently different in their performance that one would not adequately represent the other.

Process options will be evaluated using the following criteria:

- Effectiveness.
- Implementability.
- Cost.

In addition, the process evaluation will generally apply these criteria only to the technologies and the general response actions they are intended to satisfy and not to the site as a whole.

Application of these criteria is detailed in the following sections.

5.8.2.5.1 Effectiveness Evaluation

The process evaluation will generally emphasize the effectiveness criteria over implementability and cost. The identified technology processes will be evaluated on their effectiveness related to other processes within the same technology type. The effectiveness evaluation will focus on:

- The potential effectiveness of process options in handling the estimated areas or volumes of media and in meeting the remediation goals identified in the remedial action objectives.
- The potential impacts to human health and the environment during the construction and implementation phase.
- How proven and reliable the process is with respect to the contaminants and site conditions.

Site information, such as the contaminant type and concentration, the area or volume of contaminated media, and, when appropriate, rates of media removal, collection, or treatment will be reviewed as part of the process effectiveness evaluation. If necessary to evaluate the process effectiveness for specific media, preliminary analyses will be conducted and/or additional site data will be collected. A limited conceptual design of the process may be developed, and/or the potential environmental transport mechanisms associated with the process may be modeled. However, these activities are typically completed during later phases of the FS, when alternatives are evaluated on a site-wide basis.

5.8.2.5.2 Implementability Evaluation

The technical and administrative feasibility of implementing each technical process will be evaluated. Those options that are clearly ineffective, or unworkable at the site, will be eliminated during the technology process screening.

5.8.2.5.3 Cost Evaluation

Relative capital and O&M costs will be developed to screen the process options. This costs analysis will be made on the basis of engineering judgment, and each process will be evaluated as to whether costs are high, medium, or low, relative to the process options in the technology type.

5.8.2.6 Task 6 – Assemble Potential Remedial Alternatives

The general response actions and the process options chosen to represent the various technology types for each medium or unit will be combined to form alternatives for the site as a whole. Together, the alternatives will represent a range of treatment and containment combinations that will address the contamination at the site. In addition, the no-action alternative will be considered for each medium and/or unit.

5.8.2.7 Task 7 – Alternatives Screening Process

The screening process of all assembled potential remedial alternatives will be completed in three steps:

- Alternatives definition.
- Screening evaluation.
- Alternative screening.

The following sections provide details for each of these three alternative screening steps.

5.8.2.7.1 Alternatives Definition

Each alternative will be more completely defined so that the alternatives can be evaluated and compared before their screening. First, each alternative will be evaluated with regards to the specific remedial objectives to ensure that they are protective of human health and the environment for each potential pathway of concern at the site, or for those areas of the site being addressed as part of an operable unit. If more than one pathway is present, the overall risk level to receptors will be evaluated. If an alternative is found to be not fully protective, a reduction in exposure levels for one or more media will be made to attain an acceptable risk level by refining the remedial alternative. In refining alternatives, it will be noted that protectiveness will be achieved by reducing exposures to acceptable levels, but achieving these reductions in exposure may not always be possible by actually cleaning up a specific medium to these same levels. Potential actions in this situation may include refinement of the technological process specified by the remedial alternative or elimination of the alternative from consideration.

Secondly, alternatives will be more completely defined to provide sufficient quantitative information to allow differentiation among alternatives with respect to effectiveness, implementability and cost. This will include such aspects of the alternatives as the extent and volume of contaminated material and the size of the major technology and process options. Refinement of volumes or areas of contaminated media will be reviewed to ensure that an ongoing release from the site has not significantly affected contaminant levels in other media since the point in time when the alternatives were initially developed.

In addition, the following information will be developed for the various technology processes used in each alternative:

- Size and configuration of on-site treatment systems or containment structures.
- Time frame in which treatment, containment, or removal goals can be achieved.
- Rates or flow of treatment.
- Spatial requirements for constructing treatment or containment technologies, or for staging construction materials or excavated soil or waste.
- Distances for disposal technologies.
- Required permits for off-site actions and imposed limitations.

5.8.2.7.2 Screening Evaluation

Once the alternatives are completely defined, they will be evaluated against the short and long term aspects of the effectiveness, implementability and cost. The goal of this step is to reduce the number of alternatives that will undergo the more thorough and extensive analysis. In addition, while the evaluation at this time will be sufficiently detailed to distinguish among alternatives, it will be more general than the final evaluation of the detailed alternatives.

If innovative technologies are included in the remedial alternatives, the evaluation will be based on “reasonable belief” from data from full-scale applications under similar circumstances, and/or from bench-scale or pilot-scale treatability testing that supports expectations that the new technology will offer significant advantages. If TS are implemented for the site, these activities will be performed in accordance with the TS Work Plan.

The short- and long-term aspects of the following criteria will be used to develop and screen remedial alternatives:

- ***Effectiveness.*** Alternatives that do not effectively provide adequate protection of human health and the environment will be eliminated from further consideration. Each alternative will be evaluated as to its effectiveness in providing protection and the reductions in toxicity, mobility, or volume that it will achieve. Short-term effectiveness refers to the construction and implementation period. Long-term effectiveness refers to the period after the remedial action is complete.
- ***Implementability.*** Alternatives that are technically or administratively infeasible or that would require equipment, specialists, or facilities that are not available within a reasonable period of time, will be eliminated from further consideration. Technical feasibility includes the ability to construct, reliably operate and meet technology-specific regulation for process options until a remedial option is complete. Technical feasibility also includes O&M, replacement and monitoring of technical components of an alternative into the future after the remedial action is complete. Administrative feasibility refers to the ability to obtain approvals from other offices and agencies, the availability of

treatment, storage, and disposal services and capacity, and the requirements for, and availability of, specific equipment and technical specialists.

- **Cost.** Alternatives providing effectiveness and implementability similar to that of another alternative by employing a similar method of treatment or engineering control, but at greater cost, will be eliminated. Comparative estimates of the costs for all alternatives will be made with relative accuracy so that costs decision among alternatives will be sustained as the accuracy of cost estimates improves beyond the screening process. Cost estimates for screening alternatives will be based on cost curves, generic unit costs, vendor information, conventional cost-estimating guides, and prior similar estimates as modified by site-specific information. Prior estimates, site-cost experience, and good engineering judgments will be utilized to identify those unique items in each alternative that will control the comparative estimates. Both capital and O&M costs will be considered and present worth analysis of these costs will be applied.

Alternatives with the most favorable composite evaluation of all factors will be retained for further consideration during the detailed analysis. The selected alternatives will preserve the range of treatment and containment technologies initially developed.

After the evaluation has been completed, a Draft ADSM will be submitted to the EPA for review as specified in the Final RI/FS WP. An Amended Draft ADSM will be submitted to the EPA within 30 calendar days of the receipt of comments on the Draft ADSM. A Final ADSM will be submitted to the EPA within 14 calendar days of the receipt of comments on the Amended Draft ADSM.

5.8.2.8 Post Screening Activities

The results of the screening process may identify additional investigations needed to adequately evaluate the alternatives in the detailed analysis. Therefore, to ensure a smooth transition from the screening of alternatives to the detailed analysis, the action-specific ARARs will be identified and verified. In addition, treatability testing (if not done previously) and additional site characterization may be initiated.

5.8.3 Detailed Analysis of Remedial Alternatives

The detailed analysis of alternatives will consist of the analysis and presentation of the relevant information so that the site remedy can be selected. During this analysis, each alternative will be assessed against the nine evaluation criteria, and the results of this assessment will be arrayed to compare the relative performance of each alternative against those criteria. This step will identify the advantages or disadvantages among them. As a result of this analysis, sufficient information will be presented to adequately compare the alternatives, to identify and select an appropriate remedial action(s), and to demonstrate satisfaction that the remedy selection process meets the regulatory requirements.

The detailed analysis will consist of the following components:

- Further definition of each alternative, if necessary, with respect to the volumes or areas of contaminated media to be addressed, the technologies to be used, and any performance requirements associated with those technologies.
- An assessment and a summary profile of each alternative against the evaluation criteria.
- A comparative analysis among the alternatives to assess the relative performance of each alternative with respect to each evaluation criterion.
- Alternatives Definition

Each alternative will be reviewed to determine if an additional definition is required to apply the evaluation criteria consistently and to develop order-of magnitude cost estimates. Information developed to define alternatives at this stage in the FS process will consist of preliminary design calculations, process flow diagrams, sizing of key process components, preliminary site layouts, and a discussion of limitations, assumptions, and uncertainties concerning each alternative.

5.8.3.1 Evaluation Criteria

Each of the alternatives will be evaluated relative to nine criteria to develop the rationale for a remedy selection. The nine evaluation criteria include:

- Overall protection of human health and the environment.
- Compliance with ARARs.
- Long-term effectiveness and permanence.
- Reduction of toxicity, mobility, or volume.
- Short-term effectiveness.
- Implementability.
- Cost.
- State acceptance.
- Community acceptance.

The first two criteria (overall protection of human health and the environment and compliance with ARARs) will be considered threshold criteria that must be met by any selected alternative. The next five criteria (long-term effectiveness and permanence; reduction of toxicity, mobility, or volume; short-term effectiveness; implementability; cost) represent the primary criteria upon which the analysis will be based. The final two criteria (state and community acceptance) will be evaluated following comment on the RI/FS report and proposed plan and will be addressed by EPA when a final decision is being made.

A Nine Criteria Analysis Memorandum (NCAM) will be prepared that will summarize the results of this evaluation. This memorandum will be submitted for approval in accordance with the schedule identified in the Order.

5.8.3.1.1 Overall Protection of Human Health and the Environment

A final check will be made to ensure that each alternative provides adequate protection of human health and the environment. The assessment against this criterion will include a description of how the alternative, as a whole, achieves and maintains protection, and how the site risks posed through each pathway will be eliminated, reduced, or controlled through treatment, engineering or institutional controls.

5.8.3.1.2 Compliance with ARARs

This evaluation criterion will be used to determine whether each alternative will meet all of the ARARs that will be identified in previous stages of the RI/FS process. The detailed analysis relative to this criterion will summarize the requirements applicable or relevant and appropriate to an alternative, and describe how the alternative meets these requirements.

Compliance with chemical-specific, location-specific, and action-specific ARARs will be determined for each alternative. A summary of these ARARs and whether they will be attained by a specific alternative will be presented.

5.8.3.1.3 Long-term Effectiveness and Permanence

The assessment of alternatives against this criterion will address long-term effectiveness and permanence in maintaining protection of human health and the environment after remedial alternatives have been completed and response objectives have been met, as well as the degree of certainty that each alternative will prove successful. Specifically, the following components of this criterion will be addressed for each alternative:

- **Magnitude of residual risk remaining from untreated waste or treatment residuals at the conclusion of remedial activities.** The characteristics of the residual risk will be considered given the residual volume of contaminated media and the toxicity, mobility, and propensity to bioaccumulate of each residual contaminant. The magnitude of residual risk will be assessed by numerical standards such as cancer risk levels or noncancer hazard indices.
- **Adequacy and reliability of controls that will be used to manage treatment residuals, or untreated wastes, remaining at the Site.** This factor addresses:
 - The uncertainties associated with the remedial alternatives for providing long-term protection from residuals;
 - The assessment of the potential need to replace technical components of each remedial alternative (e.g., surface caps, slurry walls, or treatment systems); and

- The potential exposure pathways and risks posed should the remedial alternative need replacement.

5.8.3.1.4 Reduction of Toxicity, Mobility or Volume

The assessment of alternatives against this criterion will evaluate the anticipated performance of the specific treatment technologies for each alternative with respect to reduction of toxicity, mobility or volume of the hazardous substances. This evaluation will focus on the following specific factors for each alternative:

- The treatment process that will be used and the materials they will treat.
- The amount of hazardous materials that will be destroyed or treated.
- The percentage measure of expected reduction in toxicity, mobility or volume.
- The degree to which the treatment will be irreversible.
- The type and quantity of treatment residual that will remain following treatment.
- Whether the alternative would satisfy the statutory preference for treatment as a principal element.

When evaluating against this criterion, an assessment will be made as to whether treatment is used to reduce principal threats, including the extent to which toxicity, mobility or volume are reduced either alone or in combination.

5.8.3.1.5 Short-term Effectiveness

The assessment of alternatives against this criterion will include evaluation of the effects of each alternative during the construction and implementation phase until remedial response objectives are met. The following factors will be evaluated:

- Protection of the community during remedial actions, including any risk that may result from implementation of the proposed remedial action.
- Protection of workers during remedial actions, including threats than may be posed to workers and the effectiveness and reliability of protective measures that would be taken.
- Environmental impacts that may result from the construction and implementation of an alternative, including the reliability of the available mitigation measures in preventing or reducing the potential impacts.
- Time until remedial response objectives are achieved.
- Implementability

Evaluation with respect to this criterion will address the technical and administrative feasibility of implementing an alternative and the availability of various services and material required during its implementation. The following factors will be evaluated:

- Technical feasibility, including construction and operation, reliability of technology, ease of undertaking additional remedial action (i.e., in a situation where an interim action is or will be implemented), and effectiveness monitoring considerations.
- Administrative feasibility including the activities needed to coordinate with all offices and agencies.
- Availability of services and materials including off-site treatment, storage and disposal services; necessary equipment, specialist, and provisions; competitive services and materials; and prospective technologies.

5.8.3.1.6 Cost

This criterion will be used to evaluate the capital and O&M costs of each alternative. All indirect and direct capital costs and O&M costs associated with each alternative will be developed, including a schedule defining when they will be incurred. The level of accuracy of all costs will be estimated, and a present worth analysis will be used to evaluate expenditures that may occur over different time periods. Additional costs may be evaluated through a sensitivity analysis if there is sufficient uncertainty concerning specific assumptions. The results of the sensitivity analysis will be utilized to identify worst-case scenarios and to revise estimates of contingency or reserve funds.

5.8.3.1.7 State Acceptance

The assessment of alternatives with respect to this criterion evaluates the technical and administrative issues and concerns the state or other support agency may have regarding each of the alternatives. This evaluation will be provided by the EPA.

5.8.3.1.8 Community Acceptance

The assessment of alternatives with respect to this criterion evaluates the issues and concerns the public may have regarding each of the alternatives. This evaluation will be provided by the EPA.

5.8.4 Presentation of Individual and Comparative Analysis

A Remedial Alternatives Comparative Analysis (RACA) Report summarizing the results of the analysis of each remedial alternative will be prepared. The analysis of alternatives with respect to the specified criteria will be presented as a narrative discussion accompanied by a summary table. This information will be provided for use in the comparison of alternatives and in support of a subsequent analysis of the alternatives during the remedy selection process. The narrative

for each alternative will provide a technical description of each alternative and a discussion of the individual criteria assessment.

This memorandum will also include the comparative analysis of all options. The comparative analysis will include the evaluation of the relative performance of each alternative in relation to each specific evaluation criterion. This evaluation will identify the advantages and disadvantages of each alternative relative to one another. The comparative analysis will include a narrative discussion describing the strengths and weaknesses of each alternative relative to one another with respect to each criterion. The comparison of the differences will be measured either qualitatively or quantitatively, and will identify the substantive differences.

5.8.5 Schedule

As specified in the Order for the Site, the following memoranda and reports will be submitted in accordance with the indicated schedule.

5.8.5.1 Detailed Analysis of Alternatives for Remedial Action Reporting

The Order for the Site specifies reporting requirements describing the detailed analyses of alternatives including the NCAM, the RACA Report, and the Presentation to EPA. In addition, the results of the detailed analyses of alternatives will be detailed in a Draft FS Report that will be submitted in accordance with the schedule identified in the Final RI/FS Work Plan.

The Draft NCAM will be submitted to EPA for review and approval according to the project schedule specified in the Final RI/FS Work Plan. The Amended Draft NACM will be prepared and submitted within 30 calendar days of receipt of EPA's comments to the Draft NCAM. The Final NCAM will be then be prepared and submitted within 14 days of receipt of EPA's comment to the Amended Draft NCAM.

The initial RACA Report will be submitted to EPA for review and approval according to the project schedule specified in the Final RI/FS Work Plan. The Amended Draft RACA Report will be prepared and submitted within 30 calendar days of receipt of EPA's comments to the initial RACA Report. The Final RACA Report will be then be prepared and submitted within 14 days of receipt of EPA's comment to the Amended Draft RACA Report.

A presentation will be prepared for EPA which details and discusses the findings of the RI, the remedial action objectives, the alternatives evaluated in the FS, and the results of the comparative analysis. This presentation will be made in accordance with the schedule identified in the Final RI/FS Work Plan.

The Draft FS Report will be prepared and submitted to EPA for review and comments in accordance with the schedule identified in the Final RI/FS Work Plan. The Amended Draft FS Report will be prepared and submitted within 30 calendar days of receipt of the EPA's comments to the Draft FS Report.

5.8.5.2 Final Feasibility Study Report

The Final FS Report will provide the basis for the Proposed Plan developed by the EPA and shall document the development and analysis of remedial alternatives. The Final FS Report will be prepared and submitted to EPA within 14 calendar days of receipt EPA's comments on the Amended Draft FS Report.

6.0 SCHEDULE

The project schedule will be amended on a monthly basis and changes to the schedule will be addressed in the Monthly Progress Report. Changes to the due dates for the RI/FS deliverables (specified in the RI/FS SOW) will be approved by the EPA.

A copy of the anticipated schedule is included in Appendix J.

7.0 PROJECT MANAGEMENT

The Project Team, which is depicted in Figure 18, includes Rafael Casanova of the EPA as the Remedial Project Manager (RPM) and Stephen Halasz as the Project Coordinator (PC). Richard Bergner is the NORCO representative and the PC will be responsible for receiving NORCO concurrence on all actions.

The RPM has the authority to halt, conduct or direct Work required by the Agreed Order and to take necessary response actions. Absence of the RPM will not be a cause for work stoppage or delay.

Communication between NORCO and the EPA will predominantly be in writing and directed to the PC on behalf of NORCO and the RPM on behalf of the EPA. Communications include but are not limited to all documents, notices, reports, approvals, disapprovals and other correspondence addressed in the Agreed Order.

In matter dealing with dispute resolution the RPM and the PC will make all attempts to resolve the issue informally. If a resolution cannot be reached the procedures described in the Agreed Order will be implemented.

The NORCO Project Team, which is headed by the PC, consists of staff members from Kleinfelder, Severn Trent Laboratories and additional subcontractors. All activities will be performed in compliance with the HSP and the approved RI/FS Work Plan. Prior to the submission of this work plan the qualifications of the project team were furnished to the RPM.

Specific responsibilities concerning sampling, sample shipment and laboratory analysis are addressed in the QAPP.

Any changes to the Project Team will be reported to the RPM at least seven days before the change.

8.0 REPORTING

On a monthly basis, by the 10th of each month a Monthly Progress Report will be submitted to the EPA. The format for the report has been approved by the EPA and each report will be posted to the document repository.

8.1 RI Report

The RI Report will be prepared to document the results of the RI at the site, to provide the necessary data for use in preparing the site BHHRA, the BERA and as documentation of the data collection and analysis in support of the FS.

The RI Report includes the following information:

- Summaries of the implemented field investigation activities;
- Characterization of site conditions based on the results of the field investigations;
- Groundwater classification;
- Appropriate site-specific discussions related to the fate and transport of the site constituents; and
- Results of both the BHHRA and the BERA.

The RI Report will be prepared following EPA's guidance "Interim Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA". The report will focus on the site constituents and media of concern as well as other site-specific conditions. Those subjects identified in EPA's suggested report format and others as appropriate that pertain to the site and the results of the RI will be included in the report.

A Draft RI Report will be prepared and submitted to the EPA for review and approval according to the schedule specified in the Final RI/FS WP. The amended Draft RI Report will be submitted to the EPA within 45 calendar days of receipt of the EPA's comments related to the Draft RI Report. The Final RI Report will be submitted within 30 days of receipt of the EPA's comments related to the Amended draft RI Report.

The following report format will be used:

Executive Summary

1. Introduction

1.1 Purpose of Report

- 1.2 Site Background
 - 1.2.1 Site Description
 - 1.2.2 Site History
 - 1.2.3 Previous Investigations
- 1.3 Report Organization

2. Study Area Investigation

- 2.1 Description of Remedial Investigation Field Activities
 - 2.1.1 Surface Features
 - 2.1.2 Contaminant Source Investigations
 - 2.1.3 Meteorological Investigations
 - 2.1.4 Surface Water and Sediment Investigations
 - 2.1.5 Geological Investigations
 - 2.1.6 Soil and Vadose Zone Investigations
 - 2.1.7 Groundwater Investigations
 - 2.1.8 Human Population Surveys
 - 2.1.9 Ecological Investigations
- 2.2 If technical memoranda documenting field activities were prepared, they may be included in an appendix and summarized in this report chapter.

3. Physical Characteristics of the Study Area

- 3.1 Includes results of field activities to determine physical characteristics. These may include some, but not necessarily all, of the following:
 - 3.1.1 Surface Features
 - 3.1.2 Meteorology
 - 3.1.3 Surface-Water Hydrology
 - 3.1.4 Geology
 - 3.1.5 Soils
 - 3.1.6 Hydrogeology
 - 3.1.7 Demography and Land Use
 - 3.1.8 Ecology

4. Nature and Extent of Contamination

- 4.1 Presents the results of site characterization, both natural chemical components and contaminants in some, but not necessarily all, of the following media:
 - 4.1.1 Sources (soils, AST contents, surface water, sediments etc.)
 - 4.1.2 Soils and Vadose Zone
 - 4.1.3 Groundwater
 - 4.1.4 Surface Water and Sediments
 - 4.1.5 Air

5. Contaminant Fate and Transport

- 5.1 Potential Routes of Migration (i.e., air, surface water, ground water, etc.)
- 5.2 Contaminant Persistence

- 5.2.1 If they are applicable (i.e., for organic contaminants), describe estimated persistence in the study area environment and physical, chemical, and/or biological factors of importance for the media of interest

5.3 Contaminant Migration

- 5.3.1 Discuss factors affecting contaminant migration for the media of importance (e.g., sorption onto soils, solubility in water, movement of ground water, etc.)
- 5.3.2 Discuss modeling methods and results, if applicable.

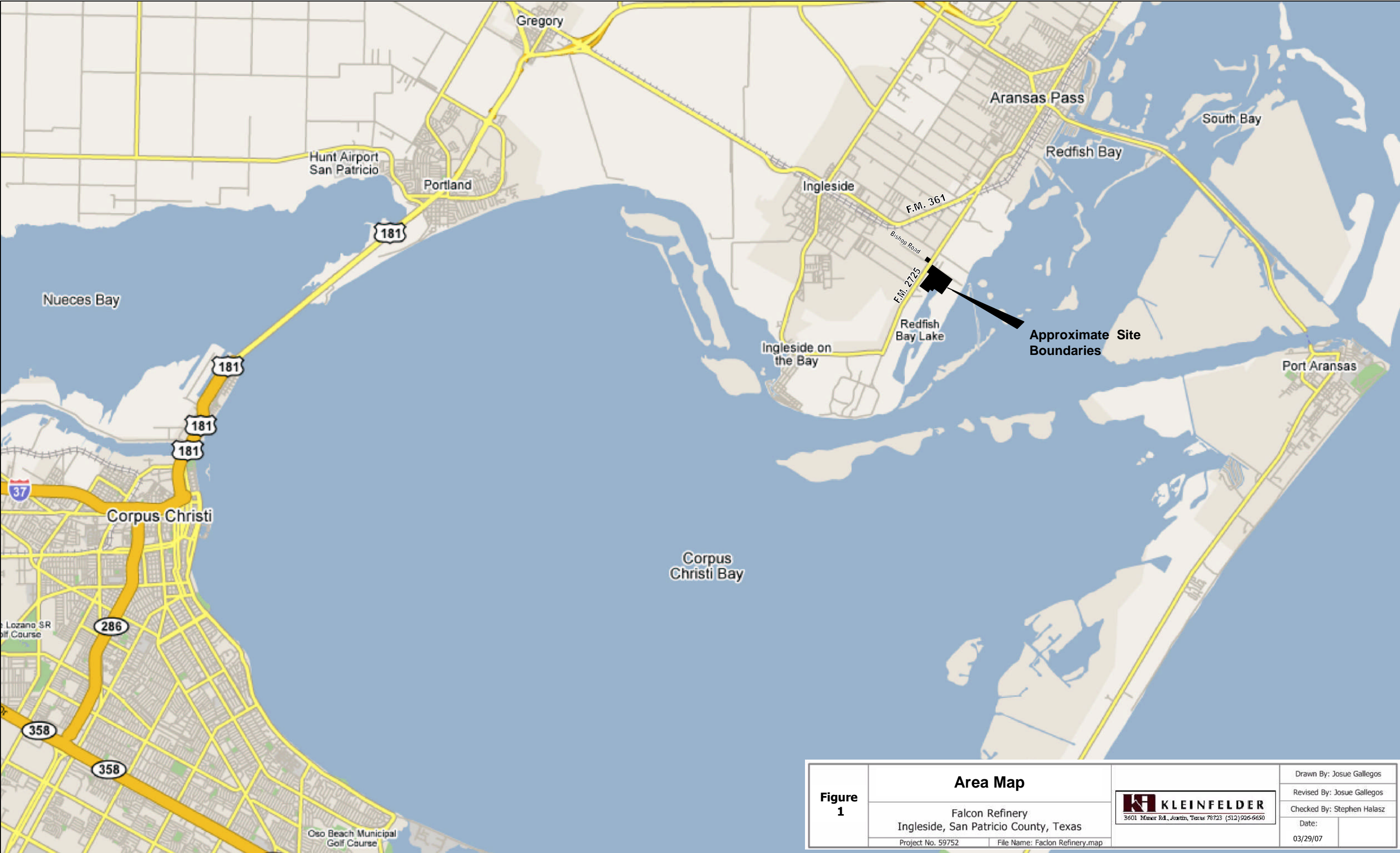
6. Baseline Risk Assessment

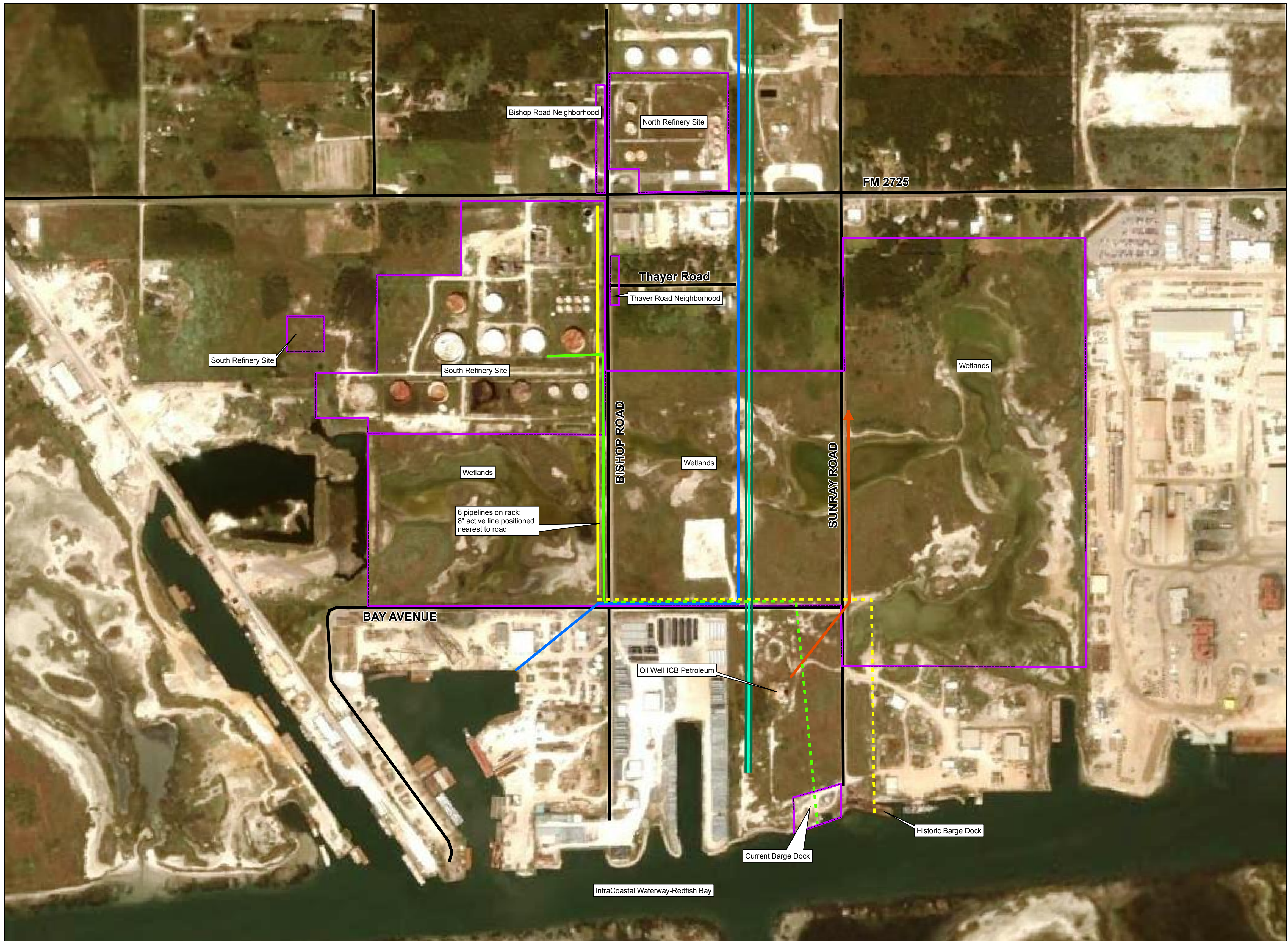
- 6.1 Human Health Evaluation
 - 6.1.1 Exposure Assessment
 - 6.1.2 Toxicity Assessment
 - 6.1.3 Risk Characterization
- 6.2 Environmental Evaluation

7. Summary and Conclusions

- 7.1 Summary
 - 7.1.1 Nature and Extent of Contamination
 - 7.1.2 Fate and Transport
 - 7.1.3 Risk Assessment
- 7.2 Conclusions
 - 7.2.1 Data Limitations and Recommendations for Future Work
 - 7.2.2 Recommended Remedial Action Objectives

FIGURES





Active NORCO Pipeline

— Above Ground

- - - Underground

Abandoned NORCO Pipeline

— Above Ground

- - - Underground

Outside Operations

— Gulf South Pipeline

— Boss Pipeline

➔ Gathering Line 2'

— Plains Marketing Pipeline

Area of Concern (AOC)

Roads

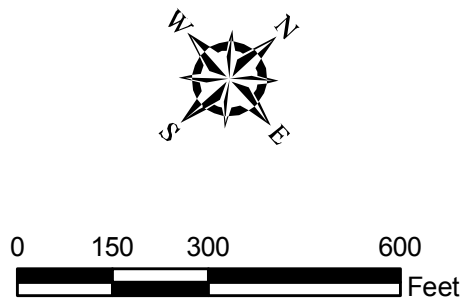
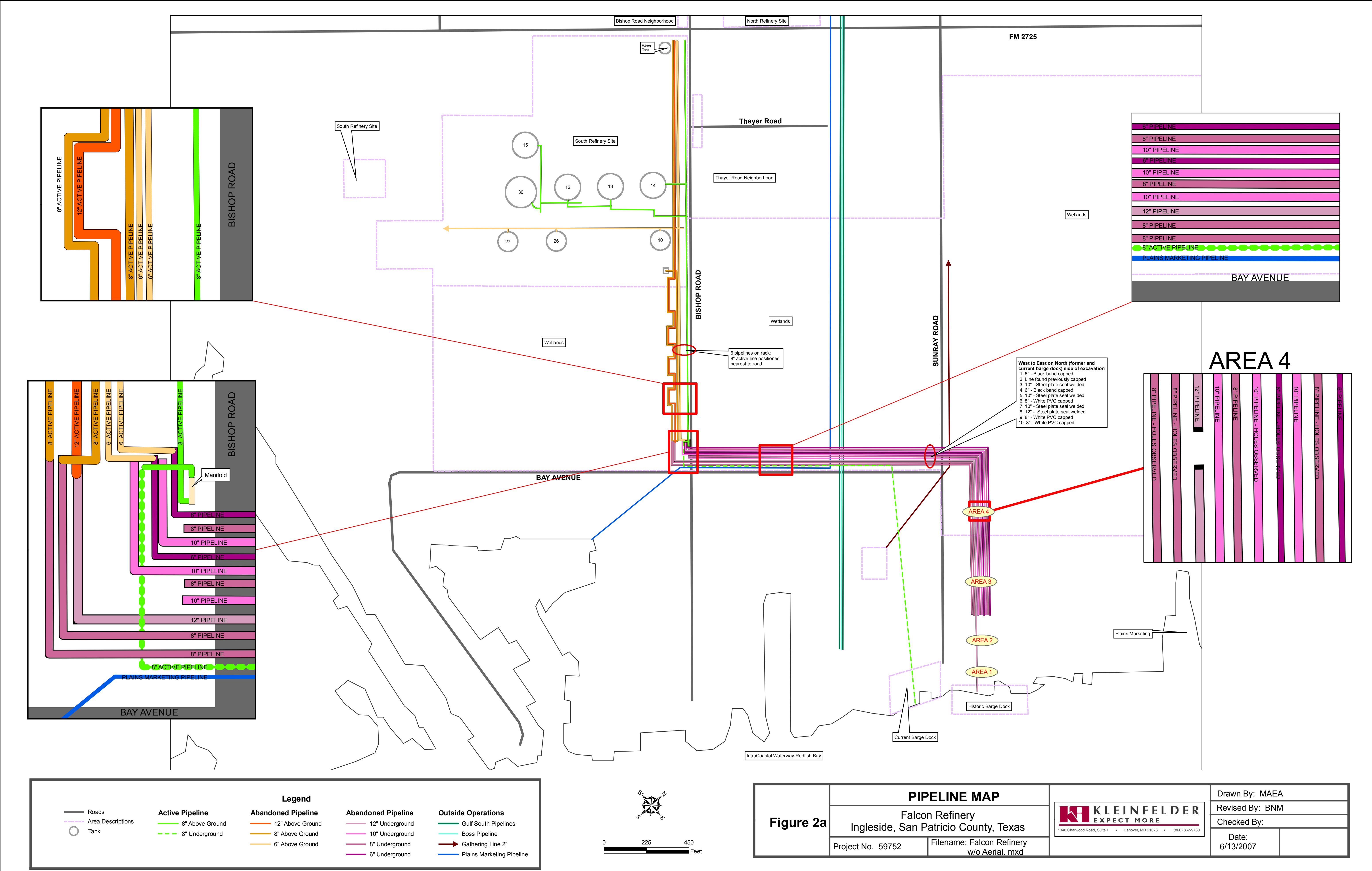


Figure 2	SITE MAP			Drawn By: MAEA		
	Falcon Refinery Ingleside, San Patricio County, Texas			Revised By: BNM		
	Project No. 59752		Filename: Falcon Refinery w/ Photo. mxd		Checked By:	
					Date: 5/8/2007	



Roads

Area Descriptions

Tank

Active Pipeline

8" Above Ground

8" Underground

Abandoned Pipeline

12" Above Ground

8" Above Ground

6" Above Ground

Abandoned Pipeline

12" Underground

10" Underground

8" Underground

6" Underground

Outside Operations

Gulf South Pipelines

Boss Pipeline

Gathering Line 2"

Plains Marketing Pipeline

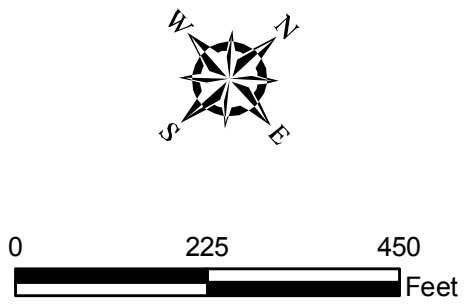


Figure 2a

PIPELINE MAP

Falcon Refinery
Ingleside, San Patricio County, Texas

Project No. 59752

Filename: Falcon Refinery
w/o Aerial. mxd

KLEINFELDER
EXPECT MORE

1340 Charwood Road, Suite 1 • Hanover, MD 21076 • (866) 862-9760

Drawn By: MAEA

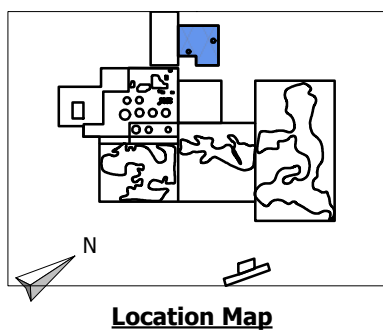
Revised By: BNM

Checked By:

Date:
6/13/2007



Note: Tanks 1,4,5,6,8, & 9 as well as the Loading Racks no longer exist.



North Site


 Area of Concern 1 North (AOC-1N)

Figure 3

North Site

Falcon Refinery
Ingleside, San Patricio County, Texas

Project No. 59752

File Name: Falcon Refinery RIFS.map



Drawn By: Josue Gallegos

Revised By: Josue Gallegos

Checked By: Stephen Halasz

Date:

03/30/07

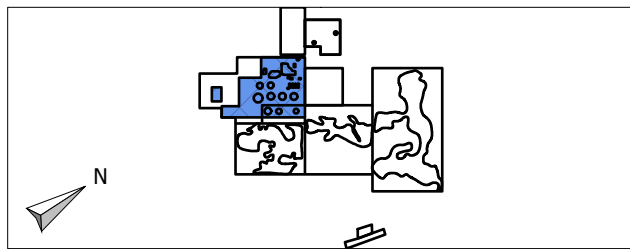


Figure 4	South Site		Drawn By: Josue Gallegos	
	Falcon Refinery		Revised By: Josue Gallegos	
	Ingleside, San Patricio County, Texas		Checked By: Stephen Halasz	
	Project No. 59752 File Name: Falcon Refinery RJFS.map		Date: 03/30/07	





Active NORCO Pipeline

Above Ground

Underground

Abandoned NORCO Pipeline

Above Ground

Underground

Outside Operations

Gulf South Pipeline

Boss Pipeline

Gathering Line 2'

Plains Marketing Pipeline

Culvert

Area Descriptions

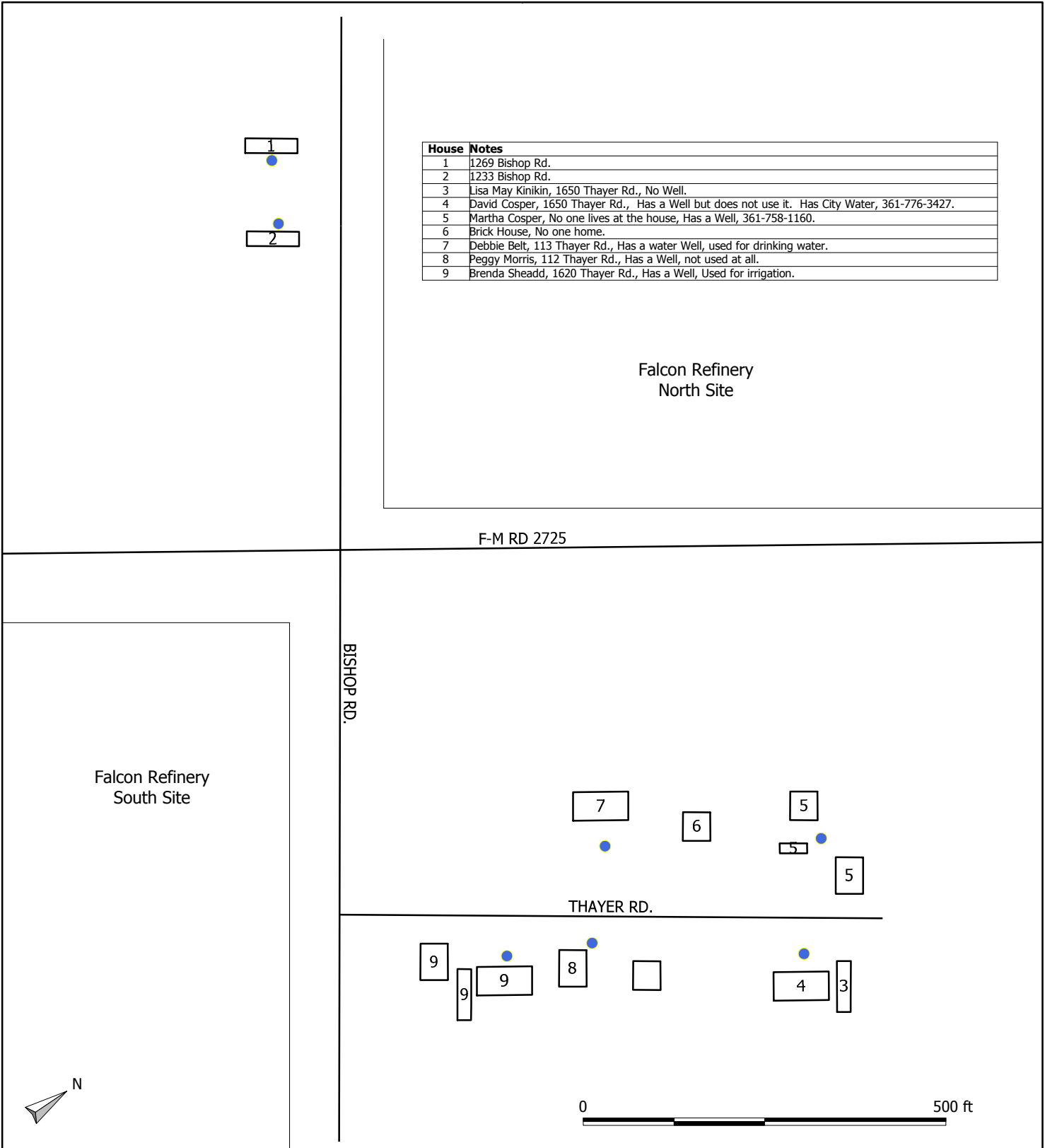
Roads

Figure 5	CULVERT MAP			Drawn By: MAEA	
	Falcon Refinery Ingleside, San Patricio County, Texas			Revised By: BNM	
	Project No. 59752		Filename: Falcon Refinery w/ Photo. mxd		Date: 5/9/2007

**SURROUNDING INDUSTRY
MAP**
Ingleside, Texas



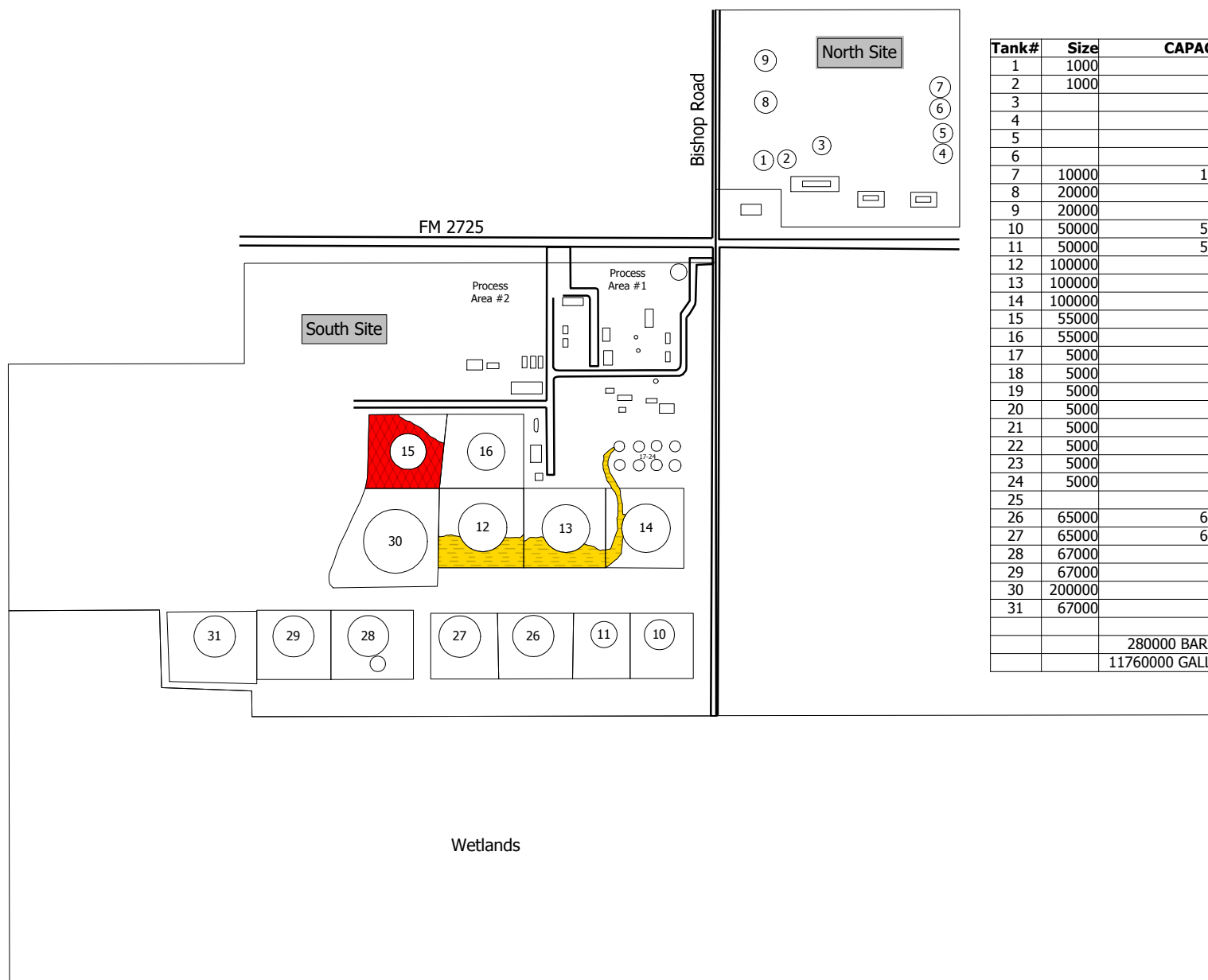
FIGURE 6



Door to Door Well Search Map

Neighborhood Water Wells
Houses
Roads


Note: Well Locations are approximate.



Tank#	Size	CAPACITY	Notes
1	1000		HAS BEEN REMOVED
2	1000		PH> 12.5 LIGHT OIL, 5% FULL
3			HAS BEEN REMOVED
4			HAS BEEN REMOVED
5			HAS BEEN REMOVED
6			HAS BEEN REMOVED
7	10000	10000	HAZ. LEAD, 10% FULL
8	20000		HAS BEEN REMOVED
9	20000		HAS BEEN REMOVED
10	50000	50000	NO ANALYSES
11	50000	50000	HAS BEEN REMOVED
12	100000		LEASED FOR CRUDE STORAGE
13	100000		LEASED FOR CRUDE STORAGE
14	100000		LEASED FOR CRUDE STORAGE
15	55000		EMPTY
16	55000		LEASED FOR CRUDE STORAGE
17	5000	5000	HAZ. BENZENE
18	5000	5000	MOSTLY WATER/MAY NOT BE
19	5000	5000	NOT ANALYZED
20	5000	5000	PH>12.5 CAUSTIC AND GASOLINE
21	5000	5000	87% WATER
22	5000	5000	MAY NOT BE
23	5000	5000	97% WATER AND GASOLINE
24	5000	5000	MOSTLY WATER
25			UNKNOWN
26	65000	65000	75%-GAS, DIESEL, LEAD AND ZINC, 20% FULL
27	65000	65000	20% FULL
28	67000		HAS BEEN REMOVED
29	67000		HAS BEEN REMOVED
30	200000		EMPTY
31	67000		HAS BEEN REMOVED
			280000 BARRELS
			11760000 GALLONS



1979 Spill Map

 Bottom Sediments


 Slop Oil Spill

Figure 8

1979 Spill Map

Falcon Refinery
Ingleside, San Patricio County, Texas

Project No. 59752 | File Name: Falcon Refinery RJFS.map

KLEINFELDER

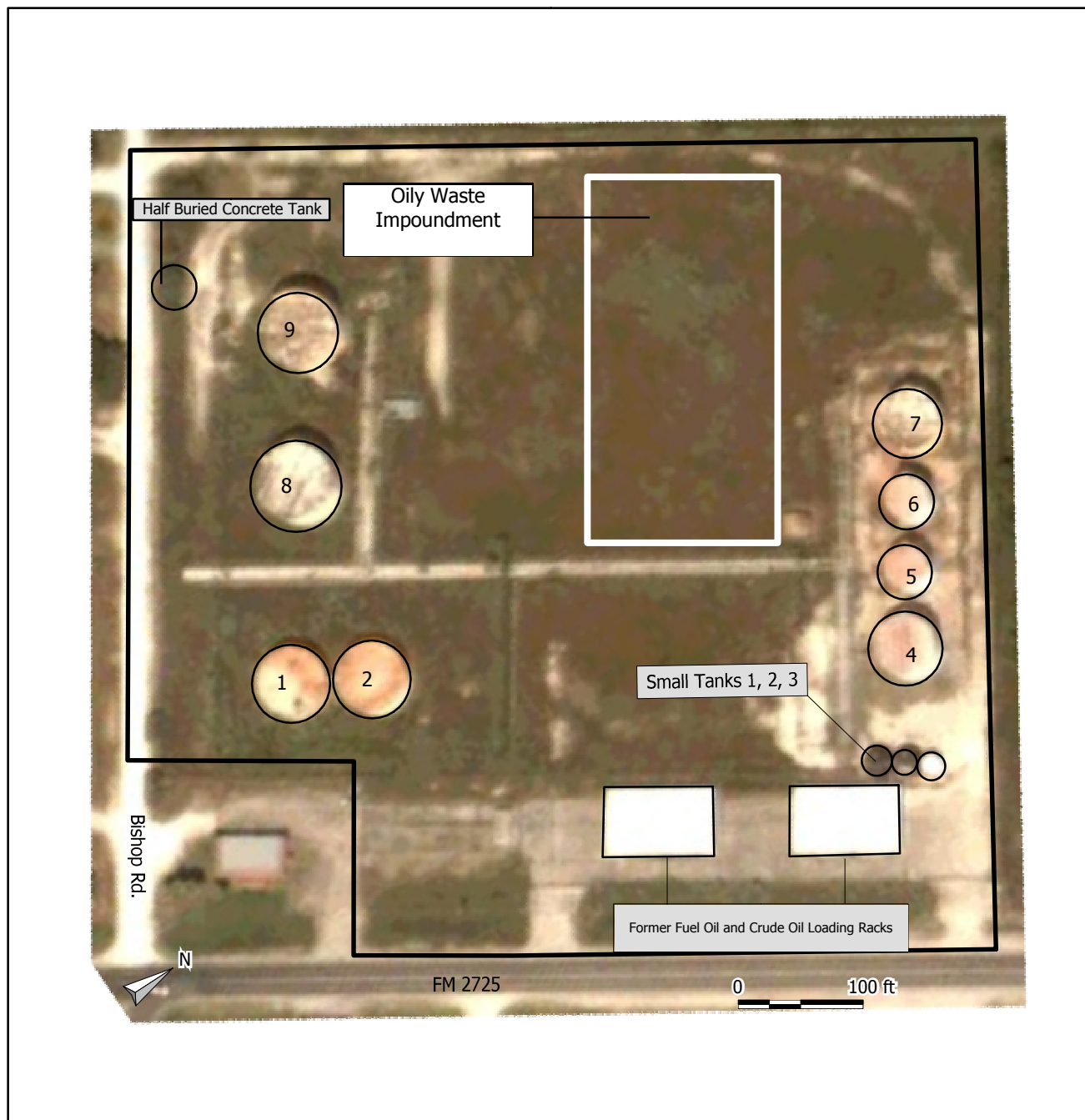
3601 Manor Rd., Austin, Texas 78723 (512) 926-6650

Drawn By: Josue Gallegos

Revised By: Josue Gallegos


Checked By: Stephen Halasz

Date: 03/30/07



Note: Impoundment was discovered during June 1979 Site Inspection.

North Site

 Area of Concern 1 North (AOC-1N)

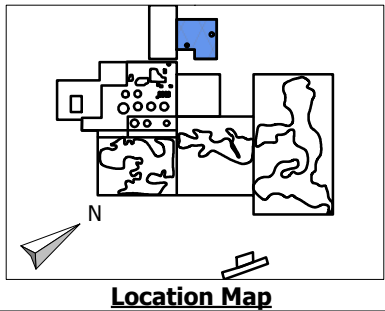
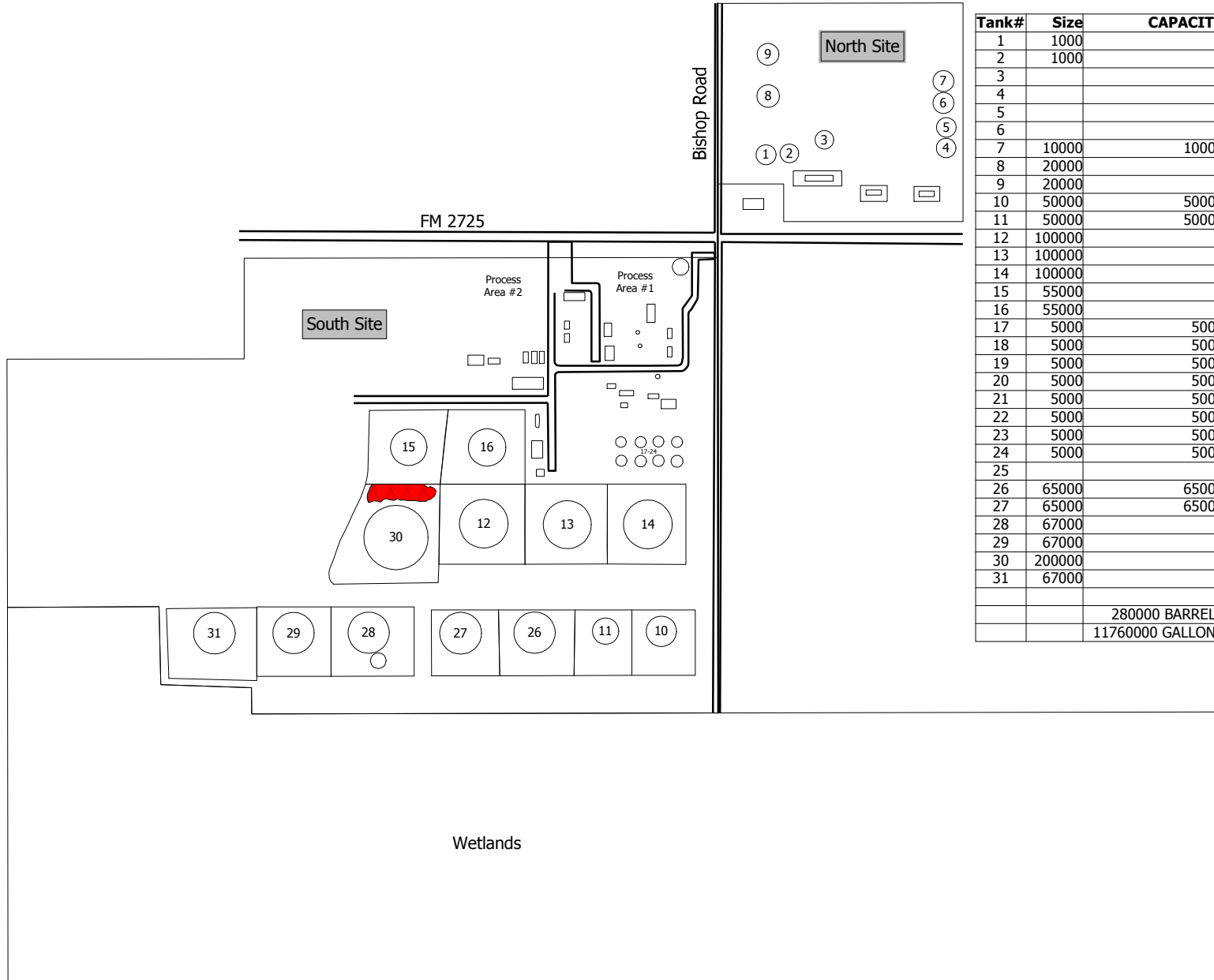


Figure 9	TDWR Inspection		<div>KLEINFELDER 3601 Manor Rd., Austin, Texas 78723 (512) 926-6650</div>	Drawn By: Josue Gallegos	
	Falcon Refinery			Revised By: Josue Gallegos	
	Ingleside, San Patricio County, Texas			Checked By: Stephen Halasz	
	Project No. 59752	File Name: Falcon Refinery RIFS.map		Date:	03/30/07



Tank#	Size	CAPACITY	Notes
1	1000		HAS BEEN REMOVED
2	1000		PH> 12.5 LIGHT OIL, 5% FULL
3			HAS BEEN REMOVED
4			HAS BEEN REMOVED
5			HAS BEEN REMOVED
6			HAS BEEN REMOVED
7	10000	10000	HAZ. LEAD, 10% FULL
8	20000		HAS BEEN REMOVED
9	20000		HAS BEEN REMOVED
10	50000	50000	NO ANALYSES
11	50000	50000	HAS BEEN REMOVED
12	100000		LEASED FOR CRUDE STORAGE
13	100000		LEASED FOR CRUDE STORAGE
14	100000		LEASED FOR CRUDE STORAGE
15	55000		EMPTY
16	55000		LEASED FOR CRUDE STORAGE
17	5000	5000	HAZ. BENZENE
18	5000	5000	MOSTLY WATER/MAY NOT BE
19	5000	5000	NOT ANALYZED
20	5000	5000	PH> 12.5 CAUSTIC AND GASOLINE
21	5000	5000	87% WATER
22	5000	5000	MAY NOT BE
23	5000	5000	97% WATER AND GASOLINE
24	5000	5000	MOSTLY WATER
25			UNKNOWN
26	65000	65000	75%-GAS, DIESEL, LEAD AND ZINC, 20% FULL
27	65000	65000	20% FULL
28	67000		HAS BEEN REMOVED
29	67000		HAS BEEN REMOVED
30	200000		EMPTY
31	67000		HAS BEEN REMOVED
		280000 BARRELS	
		11760000 GALLONS	



1982 Waste Pile-UNI Oil Co. 1/9/82

 Waste Pile-UNI Oil Co. 1/9/82

Figure 10

1982 Waste Pile Location Map

Falcon Refinery
Ingleside, San Patricio County, Texas

Project No. 59752

File Name: Falcon Refinery RIFS.map



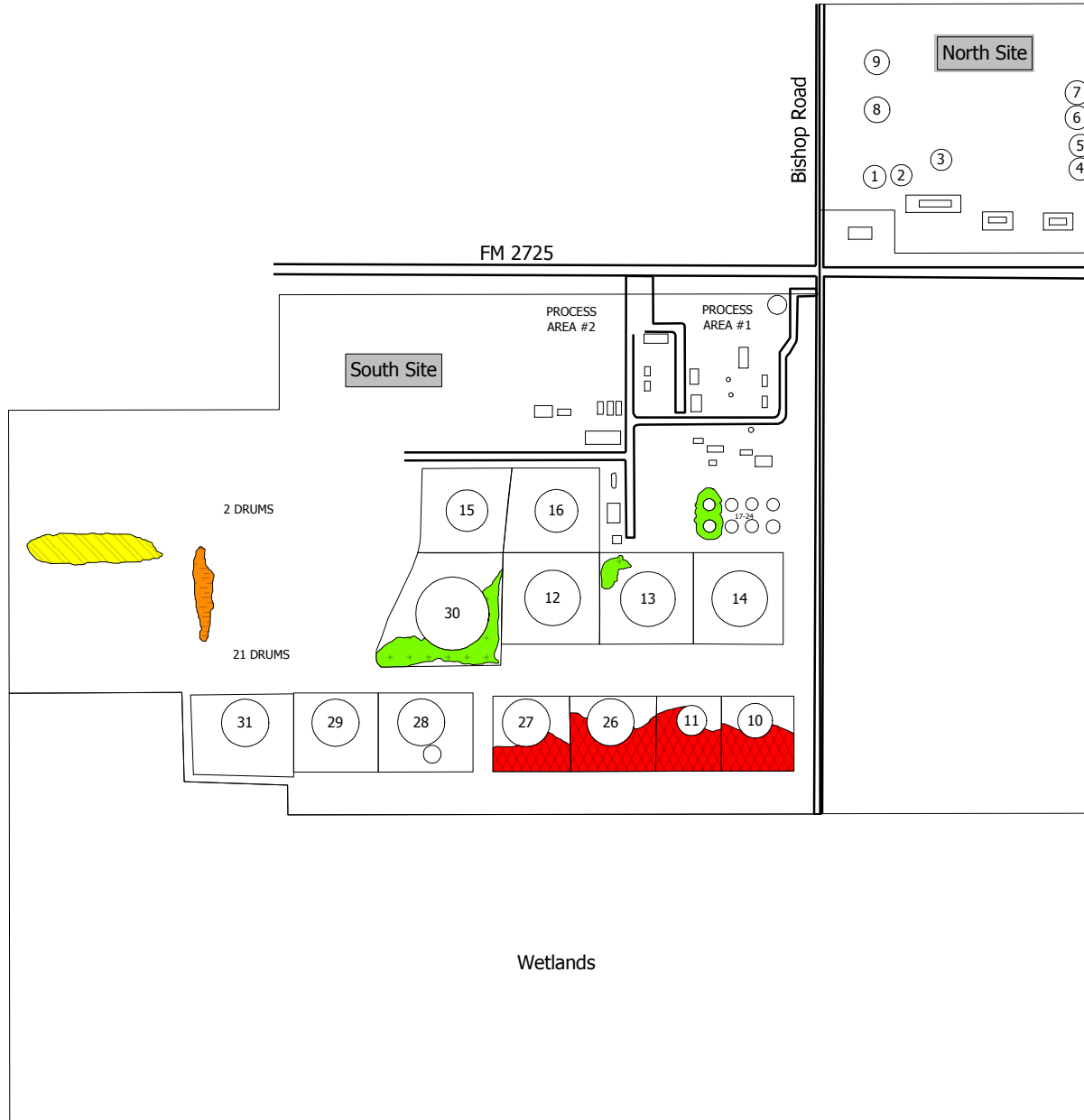
Drawn By: Josue Gallegos

Revised By: Josue Gallegos

Checked By: Stephen Halasz

Date:

03/30/07



Tank#	Size	CAPACITY	Notes
1	1000		HAS BEEN REMOVED
2	1000		PH> 12.5 LIGHT OIL, 5% FULL
3			HAS BEEN REMOVED
4			HAS BEEN REMOVED
5			HAS BEEN REMOVED
6			HAS BEEN REMOVED
7	10000	10000	HAZ. LEAD, 10% FULL
8	20000		HAS BEEN REMOVED
9	20000		HAS BEEN REMOVED
10	50000	50000	NO ANALYSES
11	50000	50000	HAS BEEN REMOVED
12	100000		LEASED FOR CRUDE STORAGE
13	100000		LEASED FOR CRUDE STORAGE
14	100000		LEASED FOR CRUDE STORAGE
15	55000		EMPTY
16	55000		LEASED FOR CRUDE STORAGE
17	5000	5000	HAZ. BENZENE
18	5000	5000	MOSTLY WATER/MAY NOT BE
19	5000	5000	NOT ANALYZED
20	5000	5000	PH> 12.5 CAUSTIC AND GASOLINE
21	5000	5000	87% WATER
22	5000	5000	MAY NOT BE
23	5000	5000	97% WATER AND GASOLINE
24	5000	5000	MOSTLY WATER
25			UNKNOWN
26	65000	65000	75%-GAS, DIESEL, LEAD AND ZINC, 20% FULL
27	65000	65000	20% FULL
28	67000		HAS BEEN REMOVED
29	67000		HAS BEEN REMOVED
30	200000		EMPTY
31	67000		HAS BEEN REMOVED
		280000 BARRELS	
		11760000 GALLONS	



1986 Spill-FDC Energy Corp. 3/12/86

Cooling Tower Sludge
 Oily Sludge
 General Plant Refuse
 Process WasteWater

Figure 11

1986 Spill Map

Falcon Refinery
Ingleside, San Patricio County, Texas

Project No. 59752 File Name: Falcon Refinery RIFS.map



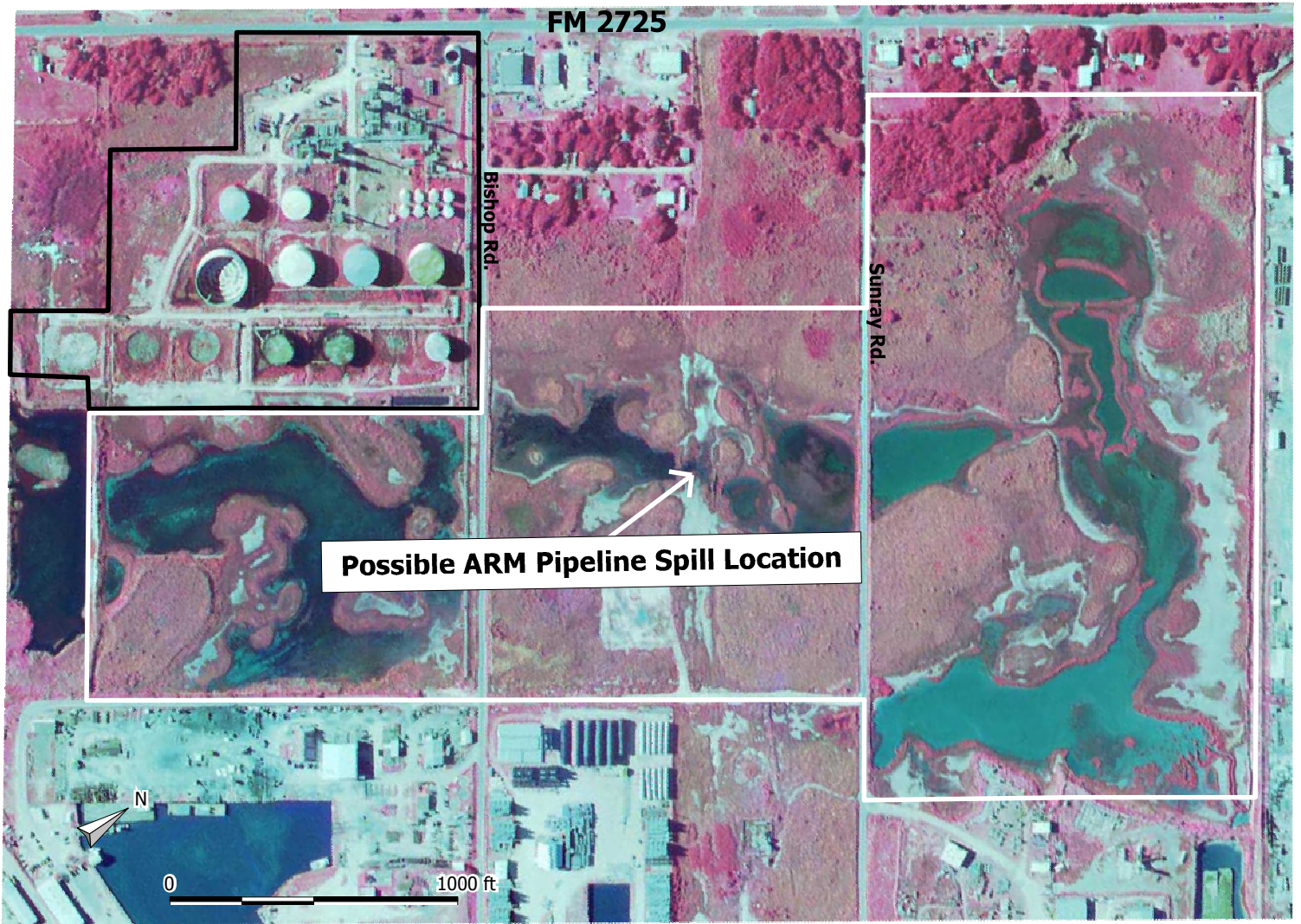
Drawn By: Josue Gallegos

Revised By: Josue Gallegos

Checked By: Stephen Halasz

Date:

03/30/07



ARM Pipeline Spill

- Area of Concern 1 South (AOC-1S)
- Area of Concern 3 (AOC-3)

Figure 12

ARM Pipeline Spill

Falcon Refinery
Ingleside, San Patricio County, Texas

Project No. 59752

File Name: Falcon Refinery RIFS.map



Drawn By: Josue Gallegos

Revised By: Josue Gallegos

Checked By: Stephen Halasz

Date:

04/3/07



MJP Pipeline Spill



-  Area of Concern 1 South (AOC-1S)
-  Area of Concern 3 (AOC-3)

Figure 13

MJP Pipeline Spill

Falcon Refinery
Ingleside, San Patricio County, Texas

Project No. 59752

File Name: Falcon Refinery RJFS.map



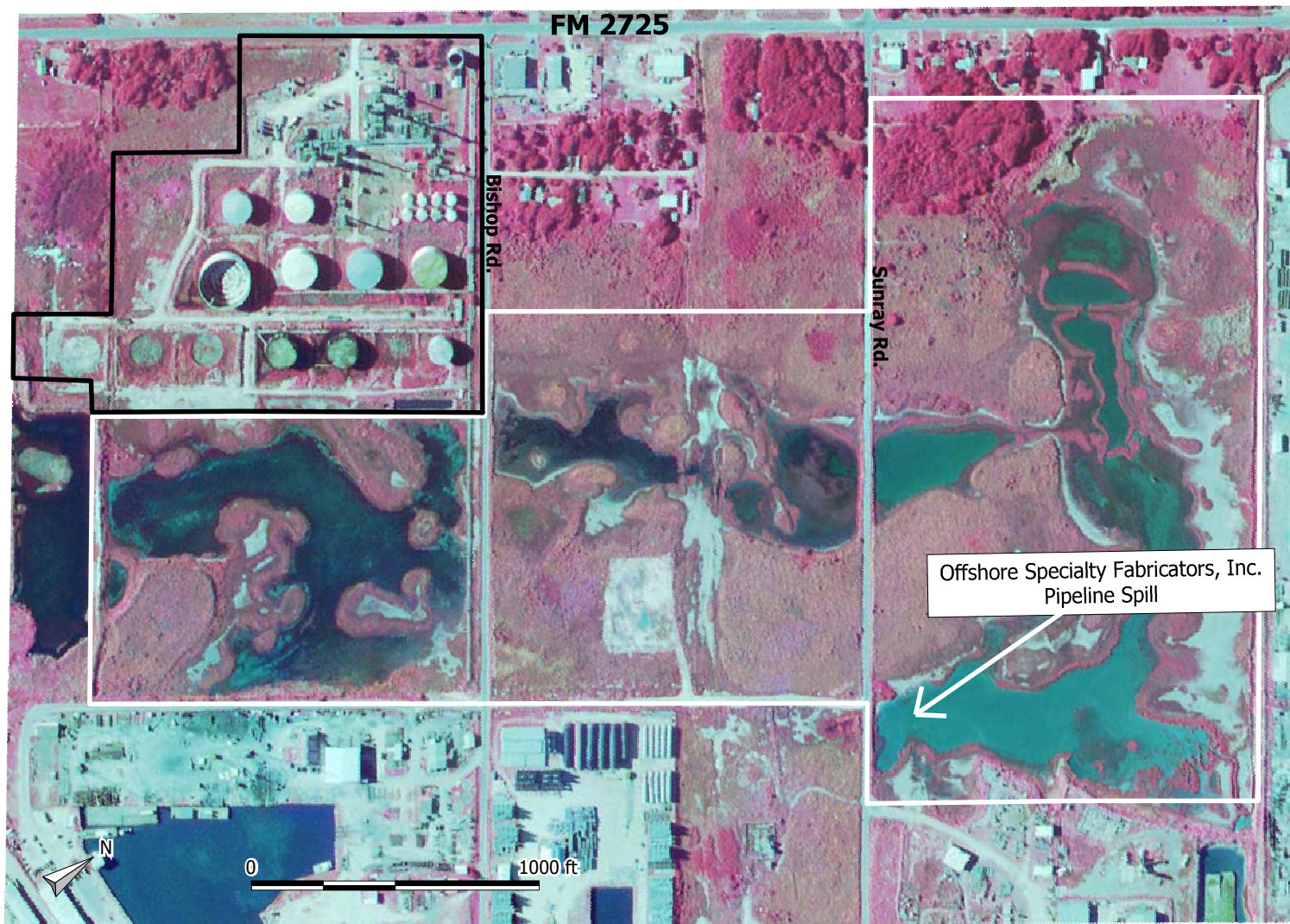
Drawn By: Josue Gallegos

Revised By: Josue Gallegos

Checked By: Stephen Halasz

Date:

04/3/07



Offshore Specialty Fabricators Pipeline Spill



-  Area of Concern 1 South (AOC-1S)
-  Area of Concern (AOC-3)

Figure 14

Offshore Specialty Fabricators Pipeline Spill

Falcon Refinery
Ingleside, San Patricio County, Texas

Project No. 59752

File Name: Falcon Refinery RIFS.map



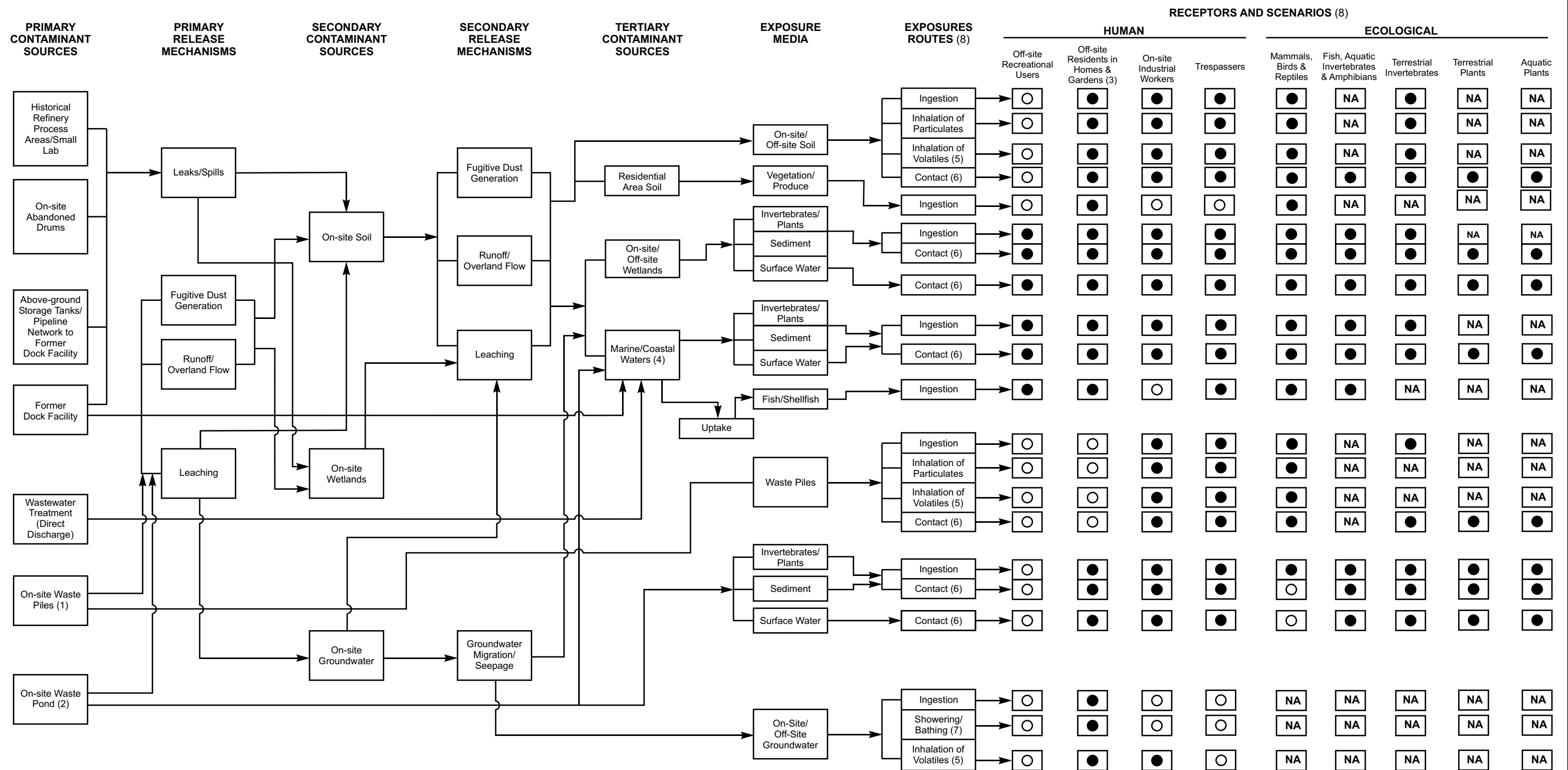
Drawn By: Josue Gallegos

Revised By: Josue Gallegos

Checked By: Stephen Halasz

Date:

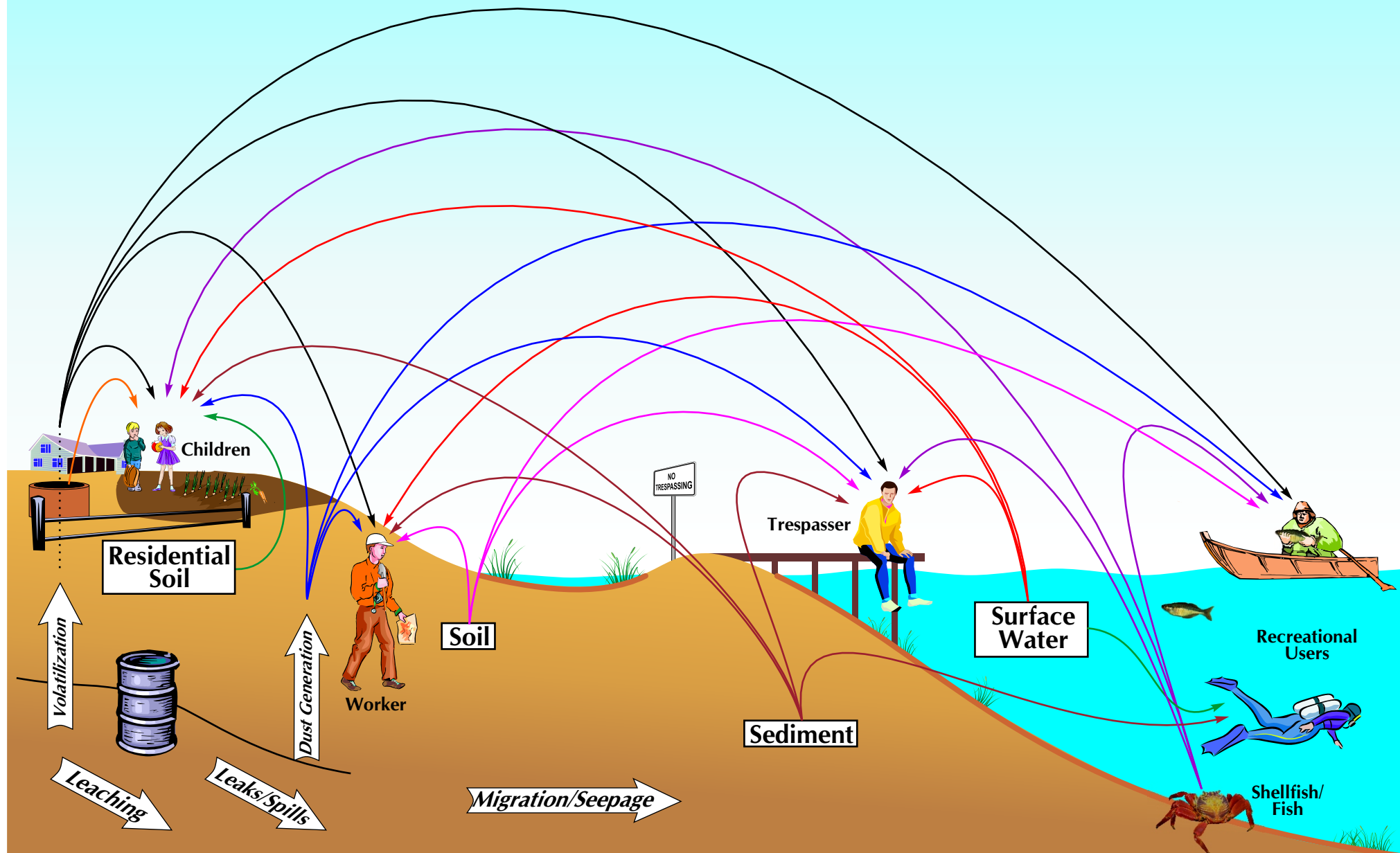
04/3/07



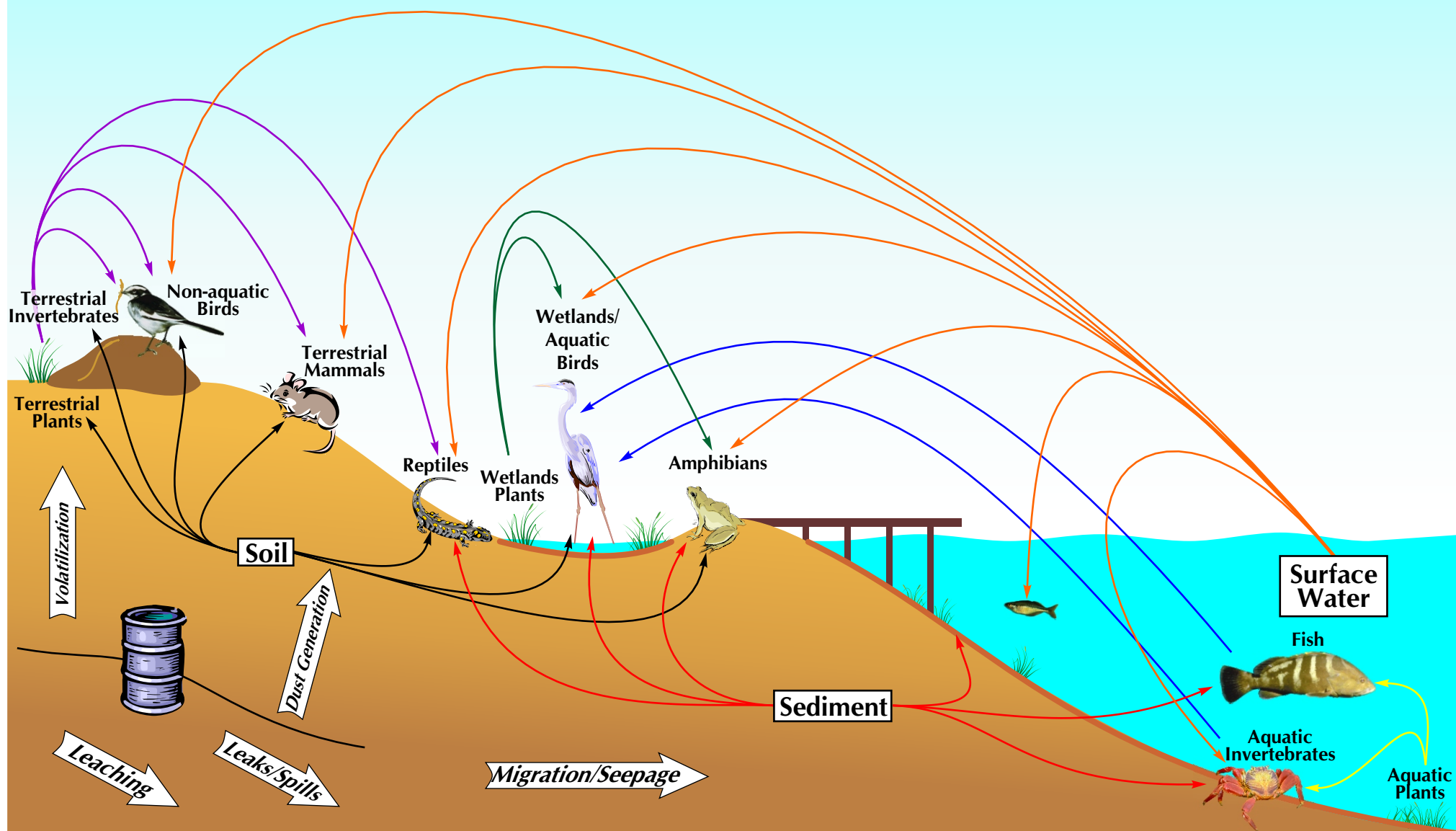
LEGEND

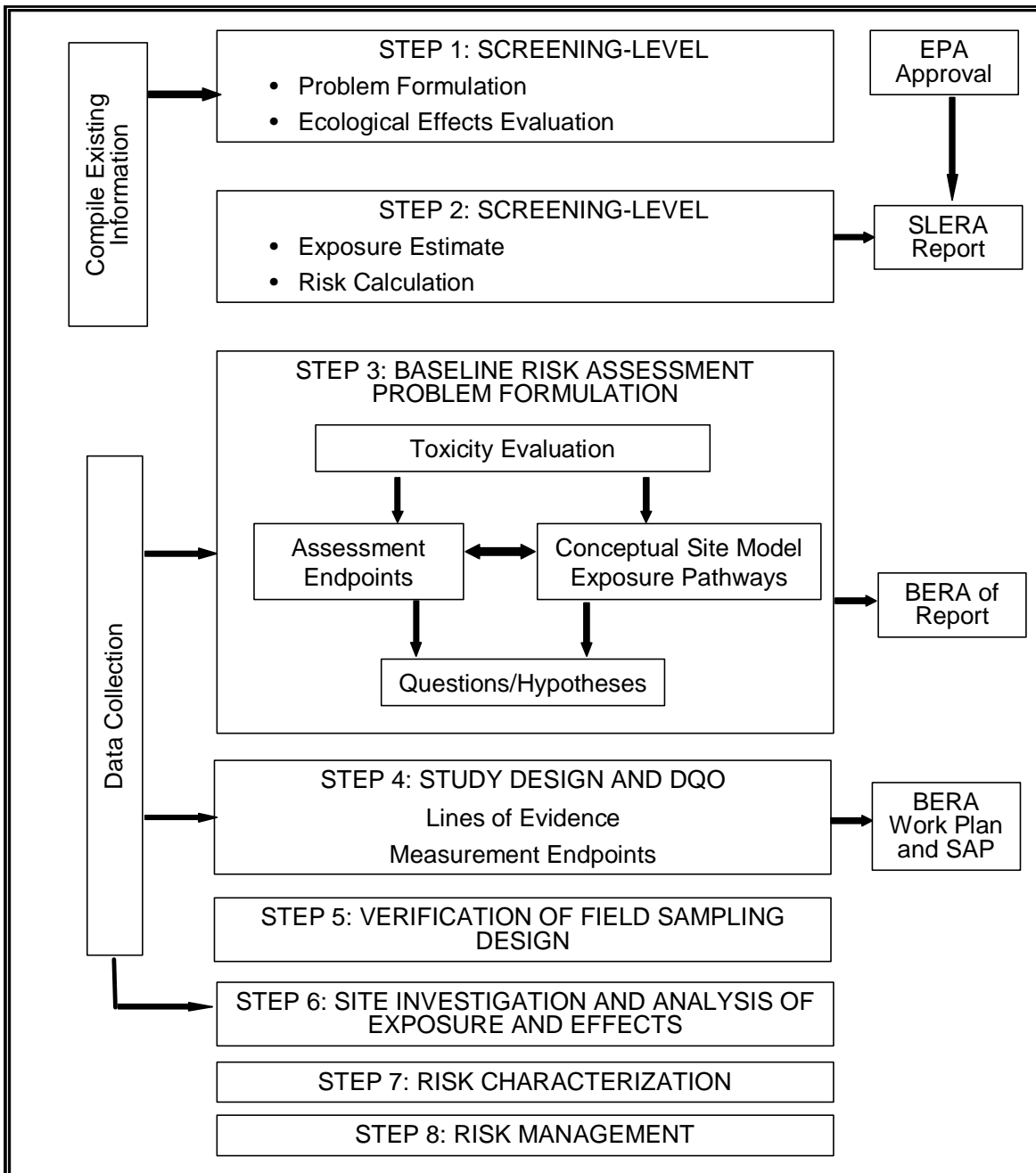
- = Pathway to be evaluated in the human health or ecological risk assessment.
- = No expectation of exposure via this pathway to the given group of receptors.
- NA = Pathway not applicable for the given group of receptors.

Conceptual Site Model Schematic for Human Receptors
Figure 16a



Conceptual Site Model Schematic for Ecological Receptors
Figure 16b





**Figure
17**

**8 STEP ECOLOGICAL RISK ASSESSMENT
PROCESS FOR SUPERFUND**

Falcon Refinery
Ingleside, San Patricio County, Texas

Project No. 59752

File Name: Falcon Refinery.map



Drawn By: Josue Gallegos

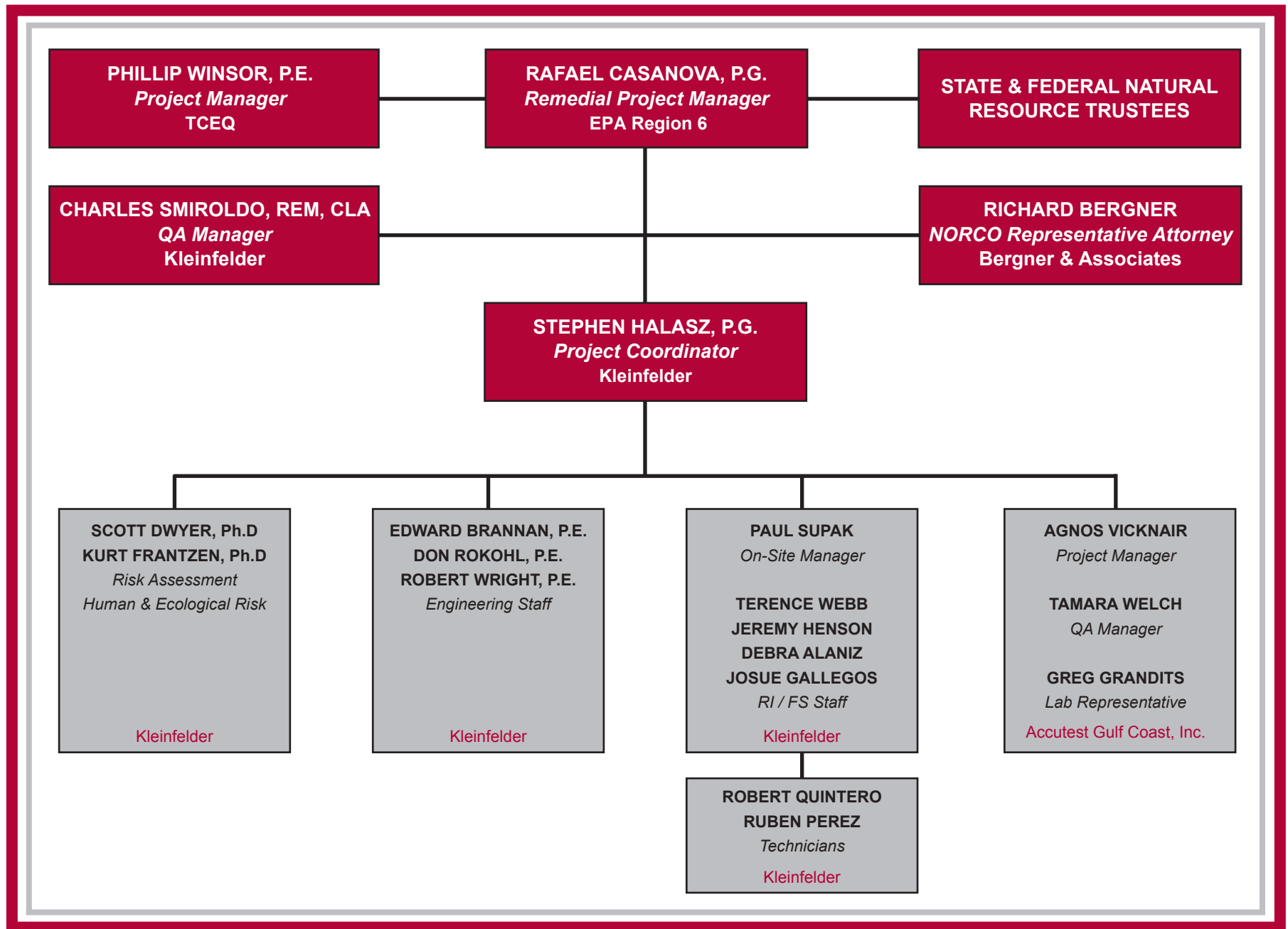
Revised By: Josue Gallegos

Checked By: Stephen Halasz

Date:

06/28/06

**FIGURE 18 - FALCON REFINERY
RI / FS Project Team Organizational Chart**



TABLES

Table 1 – Listed and Endangered and Threatened Species

AMPHIBIANS		Federal	Texas
Black Spotted Newt (<i>Notophthalmus meridionalis</i>) - can be found in wet or sometimes wet areas, such as arroyos, canals, ditches, or even shallow depressions; aestivates in the ground during dry periods; Gulf Coastal Plain south of the San Antonio River			T
Sheep Frog (<i>Hypopachus variolosus</i>) - predominantly grassland and savanna; moist sites in arid areas			T
South Texas Siren - large form (<i>Siren sp. 1</i>) - wet or sometimes wet areas, such as arroyos, canals, ditches, or even shallow depressions; aestivates in the ground during dry periods, but does require some moisture to remain; southern Texas south of Balcones Escarpment; breeds February-June			T
BIRDS		Federal	Texas
American Peregrine Falcon (<i>Falco peregrinus anatum</i>) - potential migrant; nests in west Texas	DL		E
Arctic Peregrine Falcon (<i>Falco peregrinus tundrius</i>) - potential migrant	DL		T
Brown Pelican (<i>Pelecanus occidentalis</i>) - largely coastal and near shore areas, where it roosts on islands and spoil banks	LE		E
Eskimo Curlew (<i>Numenius borealis</i>) – nonbreeding: grasslands, pastures, plowed fields, and less frequently, marshes and mudflats	LE		E
Interior Least Tern (<i>Sterna antillarum athalassos</i>) – this subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish & crustaceans, when breeding forages within a few hundred feet of colony	LE		E
Piping Plover (<i>Charadrius melodus</i>) – wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats	LT		T
Reddish Egret (<i>Egretta rufescens</i>) – resident of the Texas Gulf Coast; brackish marshes and shallow salt ponds and tidal flats; nests on ground or in trees or bushes, on dry coastal islands in brushy thickets of yucca and prickly pear			T
Sooty Tern (<i>Sterna fuscata</i>) – predominately “on the wing”; does not dive, but snatches small fish and squid with bill as it flies or hovers over water; breeding April-July			T
White-faced Ibis (<i>Plegadis chihi</i>) – prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats			T
White-tailed Hawk (<i>Buteo albicaudatus</i>) - near coast it is found on prairies, cordgrass flats, and scrub-live oak; further inland on prairies, mesquite and oak savannas, and mixed savanna-chaparral; breeding March to May			T
Whooping Crane (<i>Grus americana</i>) - potential migrant; winters in and around Aransas National Wildlife Refuge and migrates to Canada for breeding; only remaining natural breeding population of this species	LE		E
Wood Stork (<i>Mycteria americana</i>) - forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960			T

FISHES	Federal	Texas
Opossum Pipefish (<i>Microphis brachyurus</i>) – brooding adults found in fresh or low salinity waters and young move or are carried into more saline waters after birth		T
MAMMALS	Federal	Texas
Jaguarundi (<i>Herpailurus yaguarondi</i>) – thick brushlands, near water favored; six month gestation, young born twice per year in March and August	LE	E
Ocelot (<i>Leopardus pardalis</i>) - dense chaparral thickets; mesquite-thorn scrub and live oak mottes; avoids open areas; breeds and raises young June-November	LE	E
Red Wolf (<i>Canis rufus</i>) (extirpated) – formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies	LE	E
Southern Yellow Bat (<i>Lasiurus ega</i>) - associated with trees, such as palm trees (<i>Sabal mexicana</i>) in Brownsville, which provide them with daytime roosts; insectivorous; breeding in late winter		T
West Indian Manatee (<i>Trichechus manatus</i>) – summer irregular transient from Mexican or Florida populations; shallow coastal waters, estuaries, bays, rivers, and lakes; prefers rivers and estuaries to marine habitats; not averse to dredged canals or using quiet marinas; usually avoids areas with strong current.	LE	E
REPTILES	Federal	Texas
Indigo Snake (<i>Drymarchon corais</i>) - thornbrush-chaparral woodlands of south Texas, in particular dense riparian corridors; can do well in suburban and irrigated croplands if not molested or indirectly poisoned; requires moist microhabitats, such as rodent burrows, for shelter		T
Texas Horned Lizard (<i>Phrynosoma cornutum</i>) - open, arid and semi-arid regions with sparse vegetation, which could include grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September		T
Texas Scarlet Snake (<i>Cemophora coccinea lineri</i>) - mixed hardwood scrub on sandy soils; feeds on reptile eggs; semi-fossorial; active April-September		T
Texas Tortoise (<i>Gopherus berlandieri</i>) - open scrub woods, arid brush, lomas, grass-cactus association; open brush with grass understory preferred; uses shallow depressions at base of bush or cactus or underground burrow or hides under surface cover		T
Green Sea Turtle (<i>Chelonia mydas</i>)*	T	T
Hawksbill Sea Turtle (<i>Eretmochelys imbricata</i>)*	E	E
Kemp's Ridley Sea Turtle (<i>Lepidochelys kempii</i>)*	E	E
Leatherback Sea Turtle (<i>Dermochelys coriacea</i>)*	E	E
Loggerhead Sea Turtle (<i>Caretta caretta</i>)*	T	T

Status Key:

LE, LT	- Federally Listed Endangered/Threatened
PE, PT	- Federally Proposed Endangered/Threatened
E/SA, T/SA	- Federally Listed Endangered/Threatened by Similarity of Appearance
C1	- Federal Candidate for Listing, Category 1; information supports proposing to list as endangered/threatened
DL, PDL	- Federally Delisted/Proposed for Delisting
NL	- Not Federally Listed
E, T	- State Listed Endangered/Threatened
“blank”	- Rare, but with no regulatory listing status

•Reference: *Texas Parks and Wildlife Department except where noted with * (U.S. Fish & Wildlife Service).*

•Species appearing on these lists do not all share the same probability of occurrence. Some species are migrants or wintering residents only, or may be historic or considered extirpated.

•This list is under construction. Species might be added/deleted during quality control.

TABLE 2

SAMPLING DESIGN
FALCON REFINERY SUPERFUND SITE
INGLESIDE, TEXAS

SAMPLING TYPE	AREA OF CONCERN NUMBER	INTERVAL (feet bgs)	ANALYSES				
			TCL VOC	TCL SVOC	TAL METALS	PCBs	Herbicides and Pesticides
ON-SITE JUDGMENTAL SURFACE AND SUBSURFACE SOIL SAMPLES AT UP TO 43 LOCATIONS							
Geoprobe	1N	0 to 0.5	12	12	12	2	2
		0.5 to 5.0	12	12	12	2	2
	1S	0 to 0.5	31	31	31	4	4
		0.5 to 5.0	31	31	31	4	4
TOTAL FOR ON-SITE JUDGMENTAL SAMPLES			86	86	86	12	12
QC FOR JUDGMENTAL SAMPLES							
QC MS/MSD* {1/20 organics}		Various	5	5	N/A	1	1
QC MS/MD* {1/20 inorganics}		Various	N/A	N/A	5	N/A	N/A
QC trip blank (1/cooler for VOCs)		N/A	8	N/A	N/A	N/A	N/A
QC field duplicate {1/10}		Various	9	9	9	1	1
QC EQUIPMENT RINSATE		N/A	5	5	5	0	0
TOTAL QC SAMPLES			27	19	19	2	2
ON-SITE RANDOM GRID COMPOSITE SURFACE AND SUBSURFACE SOIL SAMPLES AT 25 GRID LOCATIONS							
Geoprobe	2	0 to 0.5	4	4	4	0	0
		0.5 to 5.0	4	4	4	0	0
	4	0 to 0.5	1	1	1	1	1
		0.5 to 5.0	1	1	1	1	1
TOTAL FOR GRID SAMPLES			10	10	10	2	2
QC FOR GRID SOIL SAMPLES							
QC MS/MSD* {1/20 organics}		Various	1	1	N/A	1	1
QC MS/MD* {1/20 inorganics}		Various	N/A	N/A	1	N/A	N/A
QC trip blank (1/cooler for VOCs)		N/A	2	N/A	N/A	N/A	N/A
QC field duplicate {1/10}		Various	1	1	1	1	1
QC equipment rinsate		N/A	1	1	1	1	1
TOTAL GRID QC SAMPLES			5	3	3	3	3

TABLE 2

SAMPLING DESIGN
FALCON REFINERY SUPERFUND SITE
INGLESIDE, TEXAS

SAMPLING TYPE	AREA OF CONCERN NUMBER	INTERVAL (feet bgs)	ANALYSES				
			TCL VOC	TCL SVOC	TAL METALS	PCBs	Herbicides and Pesticides
OFF-SITE JUDGMENTAL SURFACE AND SUBSURFACE SAMPLES AT 23 LOCATIONS							
Geoprobe	3	0 to 0.5	15	15	15	1	1
		0.5 to 5.0	10	10	10	1	1
	5	0 to 0.5	3	3	3	0	0
	6	0 to 0.5	3	3	3	1	1
		0.5 to 5.0	3	3	3	1	1
	7	0 to 0.5	2	2	2	1	1
		0.5 to 5.0	2	2	2	1	1
TOTAL FOR ON-SITE JUDGMENTAL SAMPLES			38	38	38	6	6
QC FOR OFF-SITE JUDGMENTAL SAMPLES AT 13 LOCATIONS							
QC MS/MSD* {1/20 organics}		Various	2	2	N/A	1	1
QC MS/MD* {1/20 inorganics}		Various	N/A	N/A	2	N/A	N/A
QC trip blank {1/cooler for VOCs}		N/A	5	N/A	N/A	N/A	N/A
QC field duplicate {1/10}		Various	4	4	4	1	1
QC EQUIPMENT RINSATE		N/A	2	2	2	1	1
TOTAL QC SAMPLES			13	8	8	3	3
OFF-SITE RANDOM GRID SURFACE AND SUBSURFACE SOIL SAMPLES AT 36 GRID LOCATIONS							
Geoprobe	3	0 to 0.5	36	36	36	4	4
TOTAL FOR GRID SAMPLES			36	36	36	4	4
QC FOR GRID SOIL SAMPLES							
QC MS/MSD* {1/20 organics}		Various	2	2	N/A	1	1
QC MS/MD* {1/20 inorganics}		Various	N/A	N/A	2	N/A	N/A
QC trip blank {1/cooler for VOCs}		N/A	5	N/A	N/A	N/A	N/A
QC field duplicate {1/10}		Various	4	4	4	1	1
QC equipment rinsate		N/A	2	2	2	0	0
TOTAL GRID QC SAMPLES			13	8	8	2	2

TABLE 2

SAMPLING DESIGN
FALCON REFINERY SUPERFUND SITE
INGLESIDE, TEXAS

SAMPLING TYPE	AREA OF CONCERN NUMBER	INTERVAL (feet bgs)	ANALYSES				
			TCL VOC	TCL SVOC	TAL METALS	PCBs	Herbicides and Pesticides
GROUNDWATER SAMPLING (20 TEMPORARY WELLS)							
Bailer	1N	Shallow aquifer	6	6	6	1	1
	1S	Shallow aquifer	14	14	14	2	2
TOTAL FOR GRID SAMPLES			20	20	20	3	3
QC FOR AQUEOUS SAMPLES (TEMPORARY WELLS)							
QC MS/MSD* {1/20 organics}		Various	1	1	N/A	1	1
QC MS/MD* {1/20 inorganics}		Various	N/A	N/A	1	N/A	N/A
QC trip blank {1/cooler for VOCs}		N/A	2	N/A	N/A	N/A	N/A
QC field duplicate {1/10}		Various	2	2	2	1	1
QC Equipment Rinsate		Various	1	1	1	1	1
TOTAL QC SAMPLES			6	4	4	3	3
SURFACE WATER SAMPLING							
Grab	3	Surface	51	51	51	8	8
	5	Surface	3	3	3	1	1
TOTAL FOR GRID SAMPLES			54	54	54	9	9
QC FOR AQUEOUS SAMPLES (SURFACE WATER)							
QC MS/MSD* {1/20 organics}		Various	3	3	N/A	1	1
QC MS/MD* {1/20 inorganics}		Various	N/A	N/A	3	N/A	N/A
QC trip blank {1/cooler for VOCs}		N/A	8	N/A	N/A	N/A	N/A
QC field duplicate {1/10}		Various	6	6	6	1	1
QC Equipment Rinsate		Various	3	3	3	1	1
TOTAL QC SAMPLES			20	12	12	3	3

TABLE 2

SAMPLING DESIGN
FALCON REFINERY SUPERFUND SITE
INGLESIDE, TEXAS

SAMPLING TYPE	AREA OF CONCERN NUMBER	INTERVAL (feet bgs)	ANALYSES				
			TCL VOC	TCL SVOC	TAL METALS	PCBs	Herbicides and Pesticides
BACKGROUND SAMPLES (JUDGMENTAL)							
Grab	Sediment	0-0.5	4	4	4	4	4
Geoprobe	Surface Soil	0-0.5	4	4	4	4	4
		0.5-5.0	4	4	4	4	4
Grab	Surface Water	N/A	4	4	4	4	4
TOTAL FOR BACKGROUND SAMPLES			16	16	16	16	16
QC FOR BACKGROUND SAMPLES							
QC MS/MSD* {1/20 organics}		Various	1	1	N/A	1	1
QC MS/MD* {1/20 inorganics}		Various	N/A	N/A	1	N/A	N/A
QC trip blank {1/cooler for VOCs}		N/A	1	N/A	N/A	N/A	N/A
QC field duplicate {1/10}		Various	2	2	2	2	2
QC Equipment Rinsate		Various	1	1	1	1	1
TOTAL QC SAMPLES			5	4	4	4	4
INVESTIGATION-DERIVED WASTE							
Hand sampling device	Site-wide	Drummed Waste	TO BE DETERMINED				
QC FOR INVESTIGATION-DERIVED WASTE							
QC MS/MSD* {1/20 organics}		Various	0	0	N/A	0	0
QC MS/MD* {1/20 inorganics}		Various	N/A	N/A	N/A	N/A	N/A
QC trip blank {1/cooler for VOCs}		N/A	0	N/A	N/A	N/A	N/A
QC field duplicate {1/10}		Various	0	0	0	0	0
QC Equipment Rinsate		Various	0	0	0	0	0
TOTAL QC SAMPLES			0	0	0	0	0

NOTES:

* MS/MSD and MS/MDs: These samples do not increase the number of samples, but represent additional volume of sample for laboratory QA/QC.

AOC Area of Concern
bgs Below Ground Surface
MD Matrix Duplicate
MS Matrix Spike

MSD Matrix Spike
N/A Not Applicable
PCB Polychlorinated Byphenyls
QC Quality Control

SVOC Semivolatile Organic Compound
VOC Volatile Organic Compound

APPENDIX A

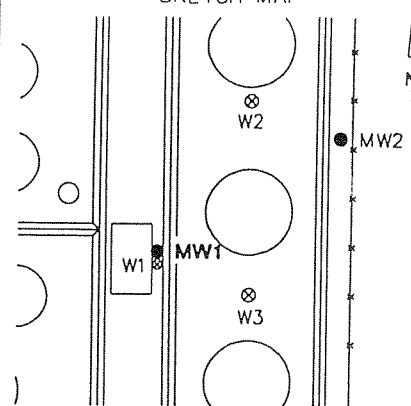
ENTRIX

HOUSTON, TEXAS

Sh. 1 of 1

WELL NUMBER MW1
 PROJECT Enjet Refining Facility OWNER Enjet, Inc.
 LOCATION Ingleside, Texas PROJECT NO. 130418
 TOTAL DEPTH 12 ft. SURFACE ELEV. N/A BOREHOLE DIA. 3 inches
 WATER FIRST ENCOUNTERED 3.5 feet 24-HRS. N/A
 SCREEN DIA. 4 inches LENGTH 10 feet SLOT SIZE 0.010 inches
 CASING DIA. 4 inches LENGTH 5 feet TYPE Sch. 40 PVC
 SCREENED INTERVAL 2 - 12 feet OTHER .
 DRILLING COMPANY JEDI DRILLING METHOD Hollow Stem Auger
 DRILLER Danny GEOLOGIST C. White DATE DRILLED 1/8/96

SKETCH MAP



DEPTH (feet)	GRAPHIC LOG	WELL CONSTRUCTION	CORE CUTTINGS	STAINING	DESCRIPTION/SOIL CLASSIFICATION
0	GM				0-0.75 feet SILTY SAND with gravel from road fill
2					0.75-3.5 feet SILTY SAND, light grey, dry
4					3.5-5 feet SILTY SAND, light grey, very wet
6	SM				5-7.25 feet SILTY SAND, dark grey to black stained, wet
8					7.25-12 feet SILTY SAND, light grey, with dark black stringers of organic material, wet
10					
12					TOTAL DEPTH = 12 FEET.
14					
16					
18					

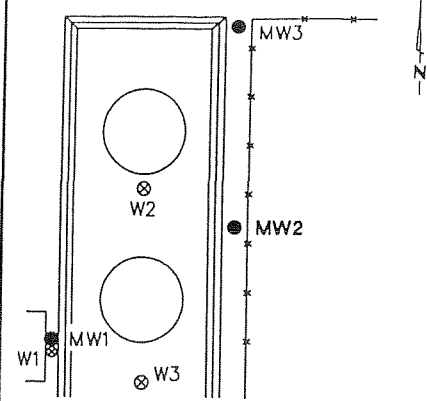
ENTRIX

HOUSTON, TEXAS

Sh. 1 of 1

PROJECT Enjet Refining Facility WELL NUMBER MW2
LOCATION Ingleside, Texas OWNER Enjet, Inc.
TOTAL DEPTH 13 ft. SURFACE ELEV. N/A BOREHOLE DIA. 3 inches
WATER FIRST ENCOUNTERED 4.5 feet 24-HRS. N/A
SCREEN DIA. 4 inches LENGTH 10 feet SLOT SIZE 0.010 inches
CASING DIA. 4 inches LENGTH 5 feet TYPE Sch. 40 PVC
SCREENED INTERVAL 3 - 13 feet OTHER .
DRILLING COMPANY JEDI DRILLING METHOD Hollow Stem Auger
DRILLER Danny GEOLOGIST C. White DATE DRILLED 1/8/96

SKETCH MAP



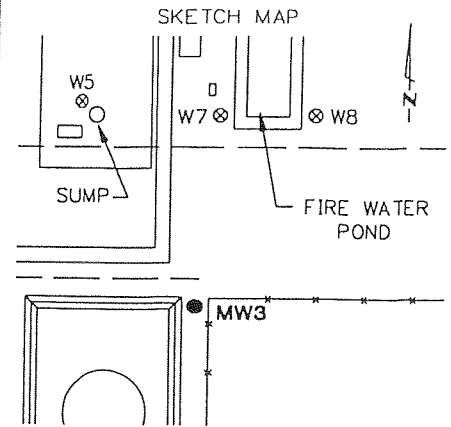
DEPTH (feet)	GRAPHIC LOG	WELL CONSTRUCTION	CORE	CUTTINGS	STAINING	DESCRIPTION/SOIL CLASSIFICATION
0						
2						
4						
6	SM					0-4.5 feet SILTY SAND, light grey to medium light grey, with medium brown mottled zones and organic materials, dry
8						
10						
12	CL					4.5-12 feet SILTY SAND, light grey, with medium brown silty sand layers. Organic material in isolated areas throughout, wet
14						12-13 feet CLAY, light greenish-grey
16						TOTAL DEPTH = 13 FEET.
18						

ENTRIX

HOUSTON, TEXAS

Sh. 1 of 1

WELL NUMBER MW3
 PROJECT Enjet Refining Facility OWNER Enjet, Inc.
 LOCATION Ingleside, Texas PROJECT NO. 130418
 TOTAL DEPTH 12 ft. SURFACE ELEV. N/A BOREHOLE DIA. 3 inches
 WATER FIRST ENCOUNTERED 4.5 feet 24-HRS. N/A
 SCREEN DIA. 4 inches LENGTH 10 feet SLOT SIZE 0.010 inches
 CASING DIA. 4 inches LENGTH 5 feet TYPE Sch. 40 PVC
 SCREENED INTERVAL 2 - 12 feet OTHER .
 DRILLING COMPANY JEDI DRILLING METHOD Hollow Stem Auger
 DRILLER Donny GEOLOGIST C. White DATE DRILLED 1/8/96



DEPTH (feet)	GRAPHIC LOG	WELL CONSTRUCTION	CORE	CUTTINGS	STAINING	DESCRIPTION/SOIL CLASSIFICATION
0						
2						
4						
6	SM					0-4.5 feet SILTY SAND, light grey, with black organic stringers and nodules, dry
8						4.5-12 feet SILTY SAND, dark brown, organic rich, grading to light grey silty sand and medium brown grey silty sand with organic material, wet
10						
12						TOTAL DEPTH = 12 FEET.
14						
16						
18						

ENTRIX

HOUSTON, TEXAS

Sh. 1 of 1

PROJECT Enjet Refining Facility

WELL NUMBER MW4

LOCATION Ingleside, Texas

OWNER Enjet, Inc.

TOTAL DEPTH 13 ft.

SURFACE ELEV. N/A

BOREHOLE DIA. 3 inches

WATER FIRST ENCOUNTERED 4 feet

24-HRS. N/A

SCREEN DIA. 4 inches

LENGTH 10 feet

SLOT SIZE 0.010 inches

CASING DIA. 4 inches

LENGTH 5 feet

TYPE Sch. 40 PVC

SCREENED INTERVAL 3 - 13 feet

OTHER .

DRILLING COMPANY JEDI

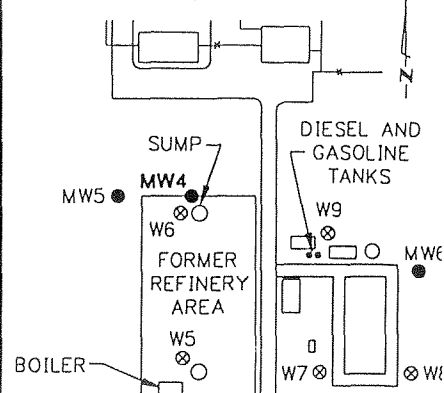
DRILLING METHOD Hollow Stem Auger

DRILLER Danny

GEOLOGIST C. White

DATE DRILLED 1/8/96

SKETCH MAP



DEPTH (feet)	GRAPHIC LOG	WELL CONSTRUCTION	CORE	CUTTINGS	STAINING	DESCRIPTION/SOIL CLASSIFICATION
0						0-4 feet SILTY SAND, medium brown, with organic material in isolated areas, grading to medium grey silty sand, dry. Slight staining at 2 ft. depth
2						
4						4-12 feet SILTY SAND, light brown grey, wet, with some organic materials and rusty blebs isolated throughout
6	SM					
8						
10						
12	CL					12-13 feet CLAY, light green
14						TOTAL DEPTH = 13 FEET.
16						
18						

ENTRIX

HOUSTON, TEXAS

Sh. 1 of 1

PROJECT Enjet Refining Facility

WELL NUMBER MW5

LOCATION Ingleside, Texas

OWNER Enjet, Inc.

TOTAL DEPTH 13 ft.

SURFACE ELEV. N/A

BOREHOLE DIA. 3 inches

WATER FIRST ENCOUNTERED 4 feet

24-HRS. N/A

SCREEN DIA. 4 inches

LENGTH 10 feet

SLOT SIZE 0.010 inches

CASING DIA. 4 inches

LENGTH 5 feet

TYPE Sch. 40 PVC

SCREENED INTERVAL 3 - 13 feet

OTHER .

DRILLING COMPANY JEDI

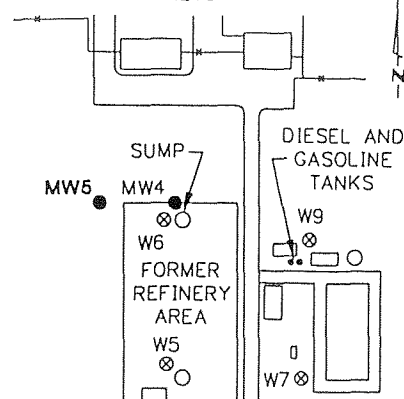
DRILLING METHOD Hollow Stem Auger

DRILLER Danny

GEOLOGIST C. White

DATE DRILLED 1/8/96

SKETCH MAP



DEPTH (feet)	GRAPHIC LOG	WELL CONSTRUCTION	CORE	CUTTINGS	STAINING	DESCRIPTION/SOIL CLASSIFICATION
0	SP					0-1 foot SAND, medium brown, with organic material, dry
2						1-4 feet SILTY SAND, light grey, with isolated layers of black organic material, dry
4	SM					4-12 feet SILTY SAND, light grey, wet. Isolated stringers and nodules of dark brown organic material and rusty blebs at 11-12 feet
12	CL					12-13 feet CLAY, light grey green
14						TOTAL DEPTH = 13 FEET.
16						
18						

ENTRIX

HOUSTON, TEXAS

Sh. 1 of 1

PROJECT Enjet Refining Facility

WELL NUMBER MW6

LOCATION Ingleside, Texas

OWNER Enjet, Inc.

TOTAL DEPTH 12 ft.

SURFACE ELEV. N/A

BOREHOLE DIA. 3 inches

WATER FIRST ENCOUNTERED 5 feet

24-HRS. N/A

SCREEN DIA. 4 inches

LENGTH 10 feet

SLOT SIZE 0.010 inches

CASING DIA. 4 inches

LENGTH 5 feet

TYPE Sch. 40 PVC

SCREENED INTERVAL 2 - 12 feet

OTHER .

DRILLING COMPANY JEDI

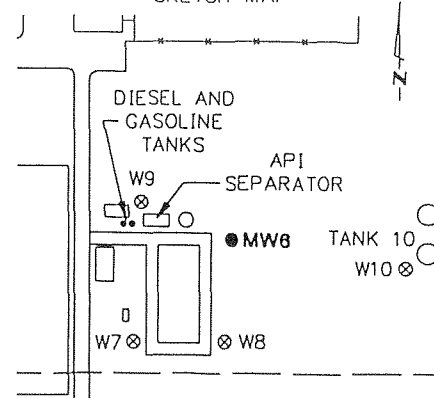
DRILLING METHOD Hollow Stem Auger

DRILLER Danny

GEOLOGIST C. White

DATE DRILLED 1/9/96

SKETCH MAP



DEPTH (feet)	GRAPHIC LOG	WELL CONSTRUCTION	CORE	CUTTINGS	STAINING	DESCRIPTION/SOIL CLASSIFICATION
0	SP					0-0.5 feet SAND, light medium brown, with grass and organic material
0.5						0.5-5 feet SILTY SAND, light grey, with black stringers of organic material, dry
2						
4	SM					
5						5-8 feet SILTY SAND, light grey, wet
6						
8						8-10 feet CLAYEY SAND, light grey, with some root materials
10	SC					
10						10-12 feet CLAY, light grey green
12	CL					TOTAL DEPTH = 12 FEET.
14						
16						
18						

ENTRIX

HOUSTON, TEXAS

Sh. 1 of 1

WELL NUMBER MW7

PROJECT Enjet Refining Facility

OWNER Enjet, Inc.

LOCATION Ingleside, Texas

PROJECT NO. 130418

TOTAL DEPTH 12 ft.

SURFACE ELEV. N/A

BOREHOLE DIA. 3 inches

WATER FIRST ENCOUNTERED 3 feet

24-HRS. N/A

SCREEN DIA. 4 inches

LENGTH 10 feet

SLOT SIZE 0.010 inches

CASING DIA. 4 inches

LENGTH 5 feet

TYPE Sch. 40 PVC

SCREENED INTERVAL 2 - 12 feet

OTHER .

DRILLING COMPANY JEDI

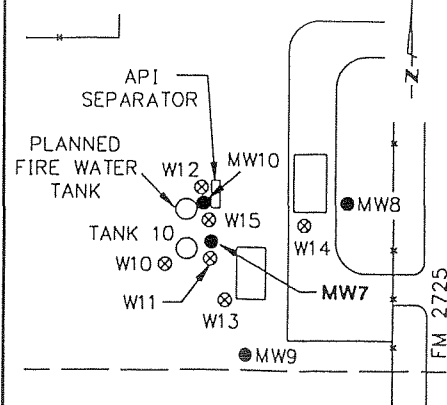
DRILLING METHOD Hollow Stem Auger

DRILLER Danny

GEOLOGIST C. White

DATE DRILLED 1/8/96

SKETCH MAP



DEPTH (feet)	GRAPHIC LOG	WELL CONSTRUCTION	CORE CUTTINGS	STAINING	DESCRIPTION/SOIL CLASSIFICATION
0	SP				0-1 foot SAND, light grey/yellow, with organic material, dry
2					1-3 feet SILTY SAND, light brownish-grey to medium dark brown, dry
4					3-5 feet SILTY SAND, dark black stained, oily, wet
6	SM				5-8 feet SILTY SAND, light grey, moist
8					8-9.75 feet SILTY SAND, medium grey stained, moist
10					9.75-12 feet SILTY SAND, light grey, with organic material and root stringers
12					TOTAL DEPTH = 12 FEET.
14					
16					
18					

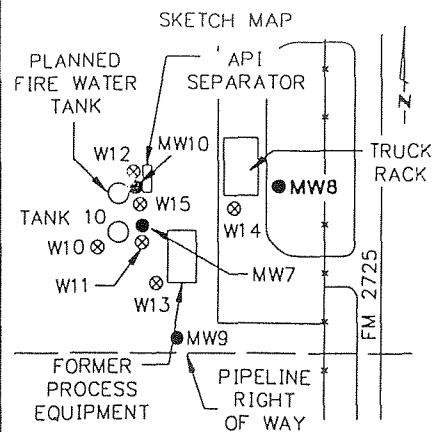
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ENTRIX

HOUSTON, TEXAS

Sh. 1 of 1

WELL NUMBER MW8
PROJECT Enjet Refining Facility OWNER Enjet, Inc.
LOCATION Ingleside, Texas PROJECT NO. 130418
TOTAL DEPTH 12 ft. SURFACE ELEV. N/A BOREHOLE DIA. 3 inches
WATER FIRST ENCOUNTERED 4.5 feet 24-HRS. N/A
SCREEN DIA. 4 inches LENGTH 10 feet SLOT SIZE 0.010 inches
CASING DIA. 4 inches LENGTH 5 feet TYPE Sch. 40 PVC
SCREENED INTERVAL 2 - 12 feet OTHER .
DRILLING COMPANY JEDI DRILLING METHOD Hollow Stem Auger
DRILLER Danny GEOLOGIST C. White DATE DRILLED 1/9/96



DEPTH (feet)	GRAPHIC LOG	WELL CONSTRUCTION	CORE CUTTINGS	STAINING	DESCRIPTION/SOIL CLASSIFICATION
0					0-1.5 feet SAND, light brown/yellow, unconsolidated with grass and roots
2					1.5-4 feet SILTY SAND, light grey with stringers of black organic materials, dry
4					4-5 feet No Recovery
6					5-12 feet SILTY SAND, light to medium brown with dark brown/grey layers, very wet to moist with depth
8					
10					
12					TOTAL DEPTH = 12 FEET.
14					
16					
18					

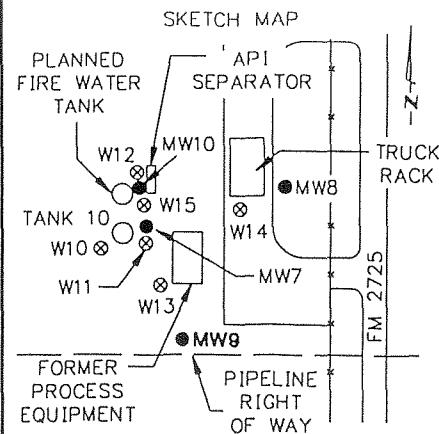
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ENTRIX

HOUSTON, TEXAS

Sh. 1 of 1

PROJECT Enjet Refining Facility WELL NUMBER MW9
LOCATION Ingleside, Texas OWNER Enjet, Inc.
PROJECT NO. 130418
TOTAL DEPTH 12 ft. SURFACE ELEV. N/A BOREHOLE DIA. 3 inches
WATER FIRST ENCOUNTERED 3 feet 24-HRS. N/A
SCREEN DIA. 4 inches LENGTH 10 feet SLOT SIZE 0.010 inches
CASING DIA. 4 inches LENGTH 5 feet TYPE Sch. 40 PVC
SCREENED INTERVAL 2 - 12 feet OTHER .
DRILLING COMPANY JEDI DRILLING METHOD Hollow Stem Auger
DRILLER Danny GEOLOGIST C. White DATE DRILLED 1/9/96



DEPTH (feet)	GRAPHIC LOG	WELL CONSTRUCTION	CORE	CUTTINGS	STAINING	DESCRIPTION/SOIL CLASSIFICATION
0	SP					0-0.75 foot SAND, light brown/yellow, unconsolidated and dry
0.75						0.75-3 feet SILTY SAND, light grey with organic material and rusty blebs, dry
2						
3						3-12 feet SILTY SAND, medium light grey brown, wet, black specks of organic material throughout
4						
6	SM					
8						
10						
12						TOTAL DEPTH = 12 FEET.
14						
16						
18						

ENTRIX

HOUSTON, TEXAS

Sh. 1 of 1

PROJECT Enjet Refining Facility

WELL NUMBER MW10

OWNER Enjet, Inc.

LOCATION Ingleside, Texas

PROJECT NO. 130418

TOTAL DEPTH 12 ft.

SURFACE ELEV. N/A

BOREHOLE DIA. 3 inches

WATER FIRST ENCOUNTERED 3 feet

24-HRS. N/A

SCREEN DIA. 4 inches

LENGTH 10 feet

SLOT SIZE 0.010 inches

CASING DIA. 4 inches

LENGTH 5 feet

TYPE Sch. 40 PVC

SCREENED INTERVAL 2 - 12 feet

OTHER .

DRILLING COMPANY JEDI

DRILLING METHOD Hollow Stem Auger

DRILLER Danny

GEOLOGIST C. White

DATE DRILLED 1/9/96

SKETCH MAP

PLANNED
FIRE WATER
TANKTANK 10
W10
W11
W12
W13
W15FORMER
PROCESS
EQUIPMENTAPI
SEPARATORPIPELINE
RIGHT OF WAYTRUCK
RACK

FM 2725

DEPTH (feet)	GRAPHIC LOG	WELL CONSTRUCTION	CORE CUTTINGS	STAINING	DESCRIPTION/SOIL CLASSIFICATION
0	SP				0-0.75 inches SAND, medium brown with grass and roots, dry
0.75-3 feet					SILTY SAND, light grey, dry
3-5.5 feet					SILTY SAND, light grey, wet
5.5-6.5 feet	SM				SILTY SAND, slight stained medium, dark grey, moist
6.5-12 feet					SILTY SAND, light grey
8-9 feet					- some black staining at 8-9 feet
12					TOTAL DEPTH = 12 FEET.
14					
16					
18					

01/15/96 15:40 LJ R:\ACAD\130418\MW10

ENTRIX

Monitoring Well ID

MW-11

PROJECT	PLX - Ingleside
LOCATION	Ingleside, Texas
TOTAL DEPTH	13.5
SURFACE ELEV.	
DRILLING COMPANY	JEDI
DRILLER	

PROJECT NO.	130425
BOREHOLE DIA.	6 5/8
DEPTH TO WATER	
DRILLING METHOD	HSA
DATE DRILLED	11/11/97
GEOLOGIST	D. Feckley

Depth (ft)	Sample Interval	Depth		Lithology
			GROUT	Sand, tan to grey
1		1	TOP OF BENTONITE	Sand, wet to saturated
2		2	BOTTOM OF BENT./TOP OF SANDPACK	
3		3	TOP OF SCREEN	Sand, tan to grey, saturated
				Sand, tan to grey, saturated
13		13	BOTTOM OF SCREEN	Sand, tan to grey, saturated
		13.5	BOTTOM OF SANDPACK	
		TOTAL DEPTH = 13.5 FEET		

ENTRIX

Monitoring Well ID

MW-12

PROJECT PLX - Ingleside

PROJECT NO. 130425

LOCATION Ingleside, Texas

BOREHOLE DIA. 6 5/8

TOTAL DEPTH	13.5
-------------	------

DEPTH TO WATER

SURFACE ELEV.

DRILLING METHOD	HSA
-----------------	-----

DRILLING COMPANY JEDI

DATE DRILLED 11/11/97

DRILLER

GEOLOGIST D. Feckley

Depth (ft)	Sample Interval		Lithology
		GROUT	Sand, tan to grey
1		TOP OF BENTONITE	Sand, wet to saturated
2		BOTTOM OF BENT./TOP OF SANDPACK	
3		TOP OF SCREEN	Sand, tan, saturated
			Sand, tan to grey, saturated
13		BOTTOM OF SCREEN	Sand, grey, saturated
		BOTTOM OF SANDPACK	
		TOTAL DEPTH = 13.5 FEET	

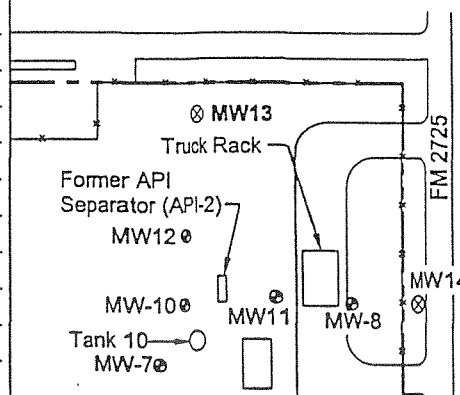
ENTRIX

HOUSTON, TEXAS

Sh. 1 of 1

PROJECT PLX Ingleside Facility WELL NUMBER MW-13
 LOCATION Ingleside, Texas OWNER PLX
 PROJECT NO. 130425
 TOTAL DEPTH 16 feet SURFACE ELEV. N/A BOREHOLE DIA. 6 5/8"
 WATER FIRST ENCOUNTERED 3.5 feet 24-HRS. -
 SCREEN DIA. 2 inches LENGTH 12.5 feet SLOT SIZE 0.010
 CASING DIA. - LENGTH - TYPE -
 SCREENED INTERVAL 2.5-15 feet OTHER -
 DRILLING COMPANY JEDI DRILLING METHOD Split Spoon
 DRILLER R. Rodriguez GEOLOGIST H. Woelfel DATE DRILLED 8/11/98

SKETCH MAP



DEPTH (feet)	GRAPHIC LOG	WELL CONSTRUCTION	CORE	CUTTINGS	% RECOVERED	DESCRIPTION/SOIL CLASSIFICATION
0						
2					40	0-16 feet SILTY SAND, light gray, loose, dry, fine to very fine sorted, subangular to subrounded.
4					70	
6					60	
8					60	Gray, silt content increasing
10					60	
12					70	Sand sized black ferrous nodules.
14						
16						TOTAL DEPTH = 16 FEET.
18						

PROJECT PLX Ingleside Facility

 WELL NUMBER MW-14

 OWNER PLX

 LOCATION Ingleside, Texas

 PROJECT NO. 130425

 TOTAL DEPTH 14 feet SURFACE ELEV. N/A BOREHOLE DIA. 6 5/8"

 WATER FIRST ENCOUNTERED 3 feet 24-HRS. -

 SCREEN DIA. 2 inches LENGTH 10 feet SLOT SIZE 0.010

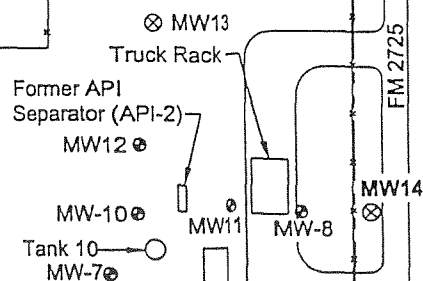
 CASING DIA. - LENGTH - TYPE -

 SCREENED INTERVAL 3-13 feet OTHER -

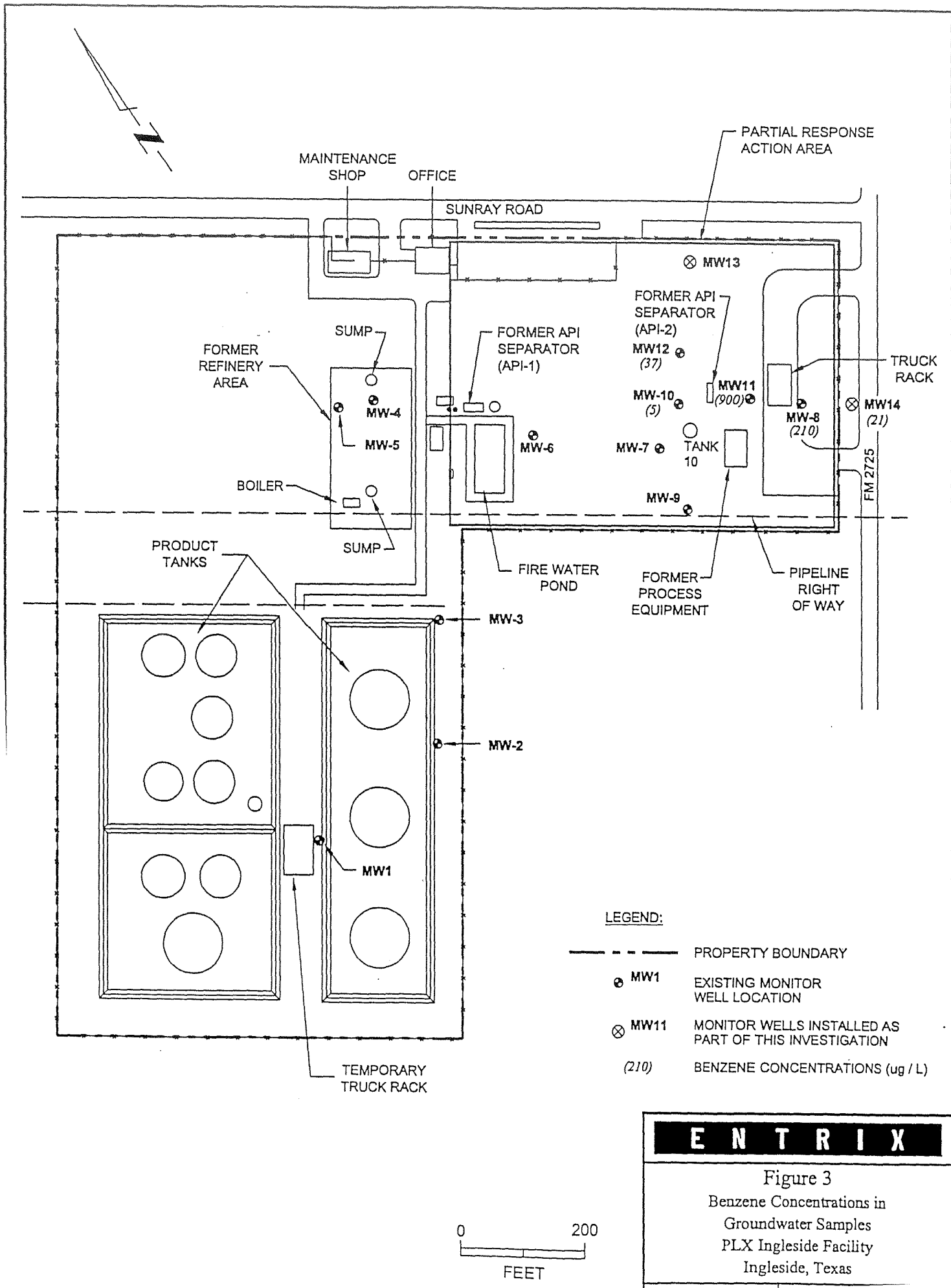
 DRILLING COMPANY JEDI DRILLING METHOD Split Spoon

 DRILLER R. Rodriguez GEOLOGIST H. Woelfel DATE DRILLED 8/11/98

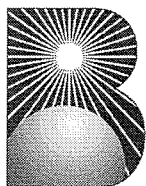
SKETCH MAP



DEPTH (feet)	GRAPHIC LOG	WELL CONSTRUCTION	CORE	CUTTINGS	% RECOVERED	DESCRIPTION/SOIL CLASSIFICATION
0						
2					40	0-16 feet SILTY SAND, light gray, loose, dry, fine to very fine, well sorted, subangular to subrounded.
4					50	
6					70	
8					70	
10					60	Gray, silt content increasing.
12					70	
14					60	12.5-14 feet SANDY CLAY, gray, stiff, saturated, slightly plastic with occasional sand-sized red and black ferrous nodules, traces of organic debris present.
16						TOTAL DEPTH = 14 FEET.
18						



APPENDIX B



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June 30, 2004

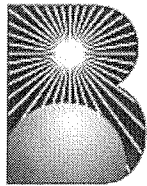
CLIENT

BNC ENGINEERING, L.L.C.- GEORGETOWN
607 River Bend Drive
Georgetown, TX 78628

SITE

Falcon Refinery
F-M 2725 & Bishop Rd.
Ingleside, TX
063004-339

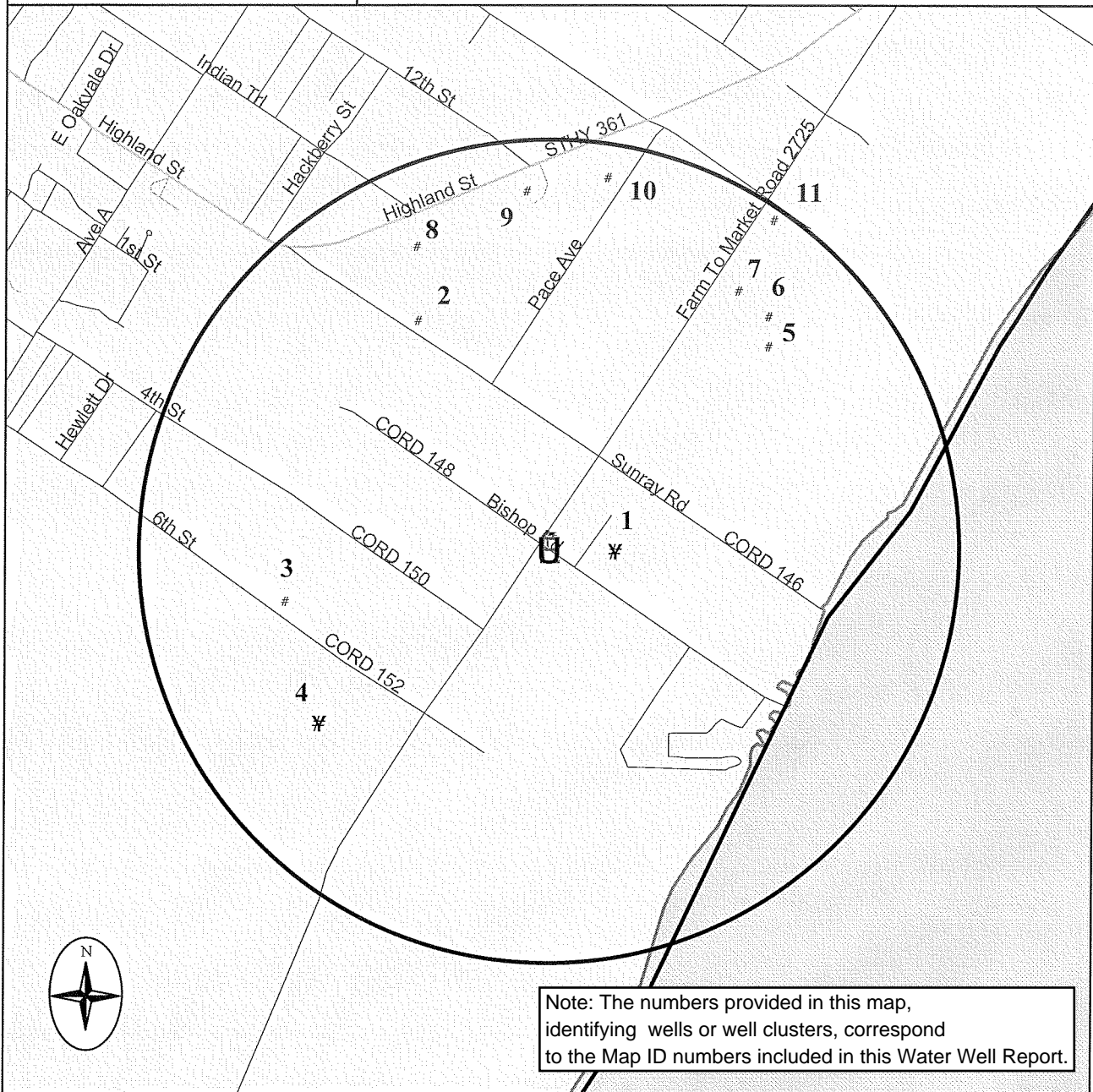
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700 N. Lamar, Suite 200 Austin, TX 78703
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Water Well Report™

Map of Wells within One Mile



Subject Site



Ground Water Wells (Cluster)



Ground Water Well



Airport



Hospital



Highway



Primary road



Secondary and connecting road



Local road



Access road



Water body



Park



State

0 0.25 0.5 0.75 1 Miles



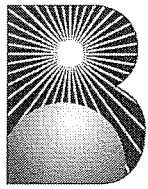
Banks Information Solutions, Inc.

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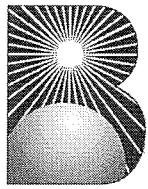
DETAILS

State ID	83-15-3A	MAP ID
Banks ID	4840900530	1
Owner Of Well	David Cosper	
Type Of Well	Domestic	
Depth Drilled	38 '	
Completion Date	10/7/1975	
Longitude	-97.17656	
Latitude	27.86052	

State ID	83-15-2F	MAP ID
Banks ID	4840900547	1
Owner Of Well	Margrett Warren	
Type Of Well	Domestic	
Depth Drilled	40 '	
Completion Date	5/30/1972	
Longitude	-97.17629	
Latitude	27.8611	

State ID	83-15-2H	MAP ID
Banks ID	4840900545	2
Owner Of Well	Don Walton	
Type Of Well	Domestic	
Depth Drilled	85 '	
Completion Date	8/9/1984	
Longitude	-97.18443	
Latitude	27.86867	

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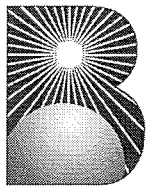
DETAILS

State ID	83-15-2L	MAP ID
Banks ID	4840900552	3
Owner Of Well	Sun Exploration & Production Co.	
Type Of Well	Domestic	
Depth Drilled	95 '	
Completion Date	9/4/1984	
Longitude	-97.1897	
Latitude	27.85876	

State ID	83-15-203	MAP ID
Banks ID	4840900423	4
Owner Of Well	H.A. Stevens	
Type Of Well	Domestic	
Depth Drilled	50 '	
Completion Date	1/1/1913	
Longitude	-97.18833	
Latitude	27.85444	

State ID	83-15-206	MAP ID
Banks ID	4840900426	4
Owner Of Well	W. T. Harris	
Type Of Well	Stock	
Depth Drilled	51 '	
Completion Date	1/1/1936	
Longitude	-97.18861	
Latitude	27.85417	

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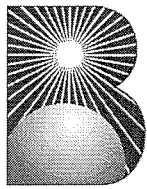
DETAILS

State ID	83-15-3A	MAP ID
Banks ID	4840900533	5
Owner Of Well	U.N.I. Oil Co. Inc	
Type Of Well	Domestic	
Depth Drilled	80 '	
Completion Date	1/31/1978	
Longitude	-97.17048	
Latitude	27.86776	

State ID	83-15-3A	MAP ID
Banks ID	4840900531	6
Owner Of Well	William Moore	
Type Of Well	Domestic	
Depth Drilled	70 '	
Completion Date	3/30/1978	
Longitude	-97.17048	
Latitude	27.86881	

State ID	83-15-204	MAP ID
Banks ID	4840900424	7
Owner Of Well	H. Blagg	
Type Of Well	Domestic	
Depth Drilled	44 '	
Completion Date	1/1/1937	
Longitude	-97.17167	
Latitude	27.86972	

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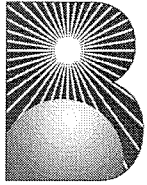
DETAILS

State ID	83-15-2H	MAP ID
Banks ID	4840900710	8
Owner Of Well	Don Breithaupt	
Type Of Well	Domestic	
Depth Drilled	73 '	
Completion Date	N/A	
Longitude	-97.18449	
Latitude	27.87128	

State ID	83-15-2E	MAP ID
Banks ID	4840900549	9
Owner Of Well	Frank W Nesbitt	
Type Of Well	Domestic	
Depth Drilled	80 '	
Completion Date	4/23/1974	
Longitude	-97.18013	
Latitude	27.87325	

State ID	83-15-2	MAP ID
Banks ID	4840900535	10
Owner Of Well	Enjet Refining Inc.	
Type Of Well	Industrial	
Depth Drilled	188 '	
Completion Date	8/24/1995	
Longitude	-97.17691	
Latitude	27.87372	

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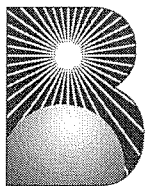
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Water Well ReportTM

DETAILS

State ID	83-15-202	MAP ID
Banks ID	4840900422	11
Owner Of Well	J.F. Granbill	
Type Of Well	Domestic	
Depth Drilled	36 '	
Completion Date	1/1/1936	
Longitude	-97.17028	
Latitude	27.87222	

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Water Well ReportTM

SUMMARY

Water Well ReportTM Research Mapping Protocol

The Banks Information Solutions, Inc. Water Well ReportTM is prepared from existing state water well databases and additional file data/records research conducted at Texas' regulatory authorities. Submission of driller's log records upon completion of a drilled water well became mandatory in 1985. The state of Texas has processed these records into several different filing systems within two state regulatory authorities. The water well files, records and map locations are maintained by the Texas Commission on Environmental Quality (TCEQ) and the Texas Water Development Board (TWDB). Actual water well site locations of this report are geocoded and geoplotted directly from the drilling records, drilling schedules, and driller's logs and maps submitted by the water well driller and maintained at these two primary water well regulatory authorities. Below is a description of the four filing systems utilized for well drilling records.

Texas Water Development Board (TWDB)

Texas Water Development Board maintains a file system of located water well locations. These well files are water well site locations that have been verified with a field inventory inspection by TWDB personnel. The wells are assigned a State Identification Number unique to that well and plotted on county base maps, U.S.G.S. 7.5 minute topographical quadrangle maps, and in-house geographic information system. Records will also include analytical data attached with each drilling record. This is the current protocol for maintaining water well records within the TWDB.

Texas Commission on Environmental Quality (TCEQ)

The Texas Commission on Environmental Quality maintains a file system of plotted, partially numbered, and un-numbered water well locations. Plotted water well files are water well site locations that have been determined from map information submitted on water well logs and subsequently plotted on TWDB county highway base maps. This type of mapping and filing procedure ceased in June 1986. Partially numbered water well files are water well site locations processed from 1986 through 1990. These wells are provided a State Identification Number which establishes the well location somewhere within a 2.5 minute quadrant of a 7.5 minute quadrangle map, but the site location has never been precisely mapped or verified by a State of Texas staff member. Un-numbered water well files are water well site locations that have been processed since June 1990. These well records are filed solely on their county location and are not provided a State Identification Number nor are they mapped. This is the current protocol for maintaining water well records within the TCEQ.

Disclaimer

Banks Information Solutions, Inc. has performed a thorough and diligent search of all wells recorded with the Texas Water Development Board and the Texas Commission on Environmental Quality. All mapped locations are based on information obtained from the TWDB and the TCEQ. Although Banks performs quality assurance and quality control on all research projects, we recognize that any inaccuracies of the records and mapped well locations could possibly be traced to the appropriate regulatory authority or the water well driller. Many water well schedules may have never been submitted to the regulatory authority by the water well driller and, thus, may explain the possible unaccountability of private drilled wells. It is uncertain if the above listing provides 100% of the existing well locations within the area of review. Therefore, Banks Information Solutions, Inc. cannot guarantee the accuracy of the data or well location(s) of those maps and records maintained by Texas' regulatory authorities.

P.O. Box 12851, Capitol Station, Austin, TX 78711

700 N. Lamar, Suite 200 Austin, TX 78703

512.478.0059 FAX 512.478.1433 e-mail banks@banksinfo.com

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MAP ID

1

3A

Send original copy by certified mail to the Texas Water Development Board P. O. Box 13087 Austin, Texas 78711

State of Texas

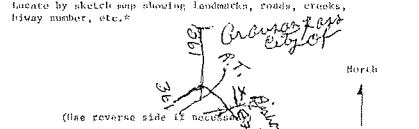
WATER WELL REPORT

For TWDB use only
Well No. 83-4-3A
Located on map 4-5
Received: Jan 1

1) OWNER:
Person having well drilled Daniel Cosper Address Box 4817, Jourdaine, Texas
(Name) (Street or RFD) (City) (State)

Landowner _____ Address _____
(Name) (Street or RFD) (City) (State)

2) LOCATION OF WELL:
County San Patricio _____ miles in 3 Direction from Aransas Pass
(N.E., S.W., etc.) (City) (State)

Locate by sketch map showing landmarks, roads, creeks, highway number, etc.

(Use reverse side if necessary)

Give legal location with distances and directions from adjacent sections or survey lines.
Lebor _____ League
Block 0 Survey P.L. TEL 7086
Abundant 2 Barton Damouth
(N.E., S.W., etc.) of Section

3) TYPE OF WELL (Check):
New Well ☒ Deepening _____
Reconditioning _____ Plugging _____
4) PROPOSED USE (Check):
Domestic ☒ Industrial _____ Municipal _____
Irrigation _____ Test Well _____ Other _____
5) TYPE OF WELL (Check):
Rotary ☒ Driven _____
Cable _____ Jetted _____ Bored _____

6) WELL LOG:
Diameter of hole 4 in. Depth drilled 45 ft. Depth of completed well 38 ft. Date drilled 10-7-76
All measurements made from 0 ft. above ground level.

From (ft.)	To (ft.)	Description and color of formation material
0	3	surface sand
3	20	clay
20	30	sand shell
30	38	clay shell
38	45	sand shell

9) CASING:
Type: Old _____ New ☒ Steel _____ Plastic ☒ Other _____
Consented From _____ ft. to _____ ft.
Diameter (inches) _____ Setting _____
From (ft.) _____ To (ft.) _____

10) SCREENS:
Type _____
Perforated _____ Slotted _____
Diameter (inches) _____ Setting _____
From (ft.) _____ To (ft.) _____ Slot Size _____

7) COMPLETION (Check):
(Use reverse side if necessary)
Straight wall _____ Gravel packed _____ Other _____
Under reamed _____ Open pipe

8) WATER LEVEL:
Static level 4 ft. below land surface Date _____
Artesian pressure _____ lbs. per square inch Date _____
Depth to pump bowls, cylinder, jet, etc., _____ ft. below land surface.

11) WELL TESTS:
Was a pump test made? Yes _____ No ☒ If yes, by whom? _____
Yield: _____ gpm with _____ ft. drawdown after _____ hrs.
Fall test _____ gpm with _____ ft. drawdown after _____ hrs.
Artesian flow _____ gpm
Temperature of water _____

12) WATER QUALITY:
Was a chemical analysis made? Yes _____ No ☒
Did any strata contain undesirable water? Yes _____ No ☒
Type of water? acid depth of strata 700

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief.

NAME MILTON MUNDINE Water Well Drillers Registration No. 171
(Type or Print)

ADDRESS P.O. Box 436 ROCKPORT TEXAS
(Street or RFD) (City) (State)

(Signed) Sam _____
(Water Well Driller) (Company Name)

Please attach electric log, chemical analysis, and other pertinent information, if available.

*Additional instructions on reverse side.

TWDB-100-1000

4840900530

MAP ID

1

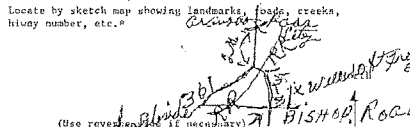
Send original copy by
certified mail to the
Texas Water Development Board
P. O. Box 12366
Austin, Texas 78711

State of Texas

WATER WELL REPORT

83-15.2F

For TWDB use only
Well No. 83-15.2F
Located on map 15.2F
Received: 11/1/83

1) OWNER: Person having well drilled <u>Margitt, W. C.</u> Address <u>Route One, Ingleside, Texas</u> (Name) (Street or RFD) (City) (State) Landowner <u>Same</u> Address <u>Same</u> (Name) (Street or RFD) (City) (State)																			
2) LOCATION OF WELL: County <u>San Patricio</u> miles in <u>3 1/2 S</u> direction from <u>Rockport, Texas</u> (N.E., S.W., etc.) (Town) Locate by sketch map showing landmarks, roads, creeks, highway number, etc.  (Use reverse if necessary) or Give legal location with distances and directions from adjacent sections or survey lines. Labor _____ League _____ Block _____ Survey <u>Custom</u> Abstract No. <u>None</u> (N.W., N.E., S.W., S.E.) of Section <u>Four North</u>																			
3) TYPE OF WORK (Check): New Well <input checked="" type="checkbox"/> Deepening _____ Reconditioning _____ Plugging _____	4) PROPOSED USE (Check): Domestic <input checked="" type="checkbox"/> Industrial _____ Municipal _____ Irrigation _____ Test Well _____ Other _____																		
5) TYPE OF WELL (Check): Rotary <input checked="" type="checkbox"/> Driven _____ Aug _____ Cable _____ Jetted _____ Bored _____																			
6) WELL LOG: Diameter of hole <u>4</u> in. Depth drilled <u>45</u> ft. Depth of completed well <u>48</u> ft. Date drilled <u>5-30-72</u> All measurements made from <u>0</u> ft. above ground level.																			
<table border="1"> <thead> <tr> <th>From (ft.)</th> <th>To (ft.)</th> <th>Description and color of formation material</th> </tr> </thead> <tbody> <tr> <td>0-6</td> <td>6</td> <td>Surface sand</td> </tr> <tr> <td>6-20</td> <td>20</td> <td>light clay</td> </tr> <tr> <td>20-30</td> <td>30</td> <td>dark blue sand</td> </tr> <tr> <td>30-40</td> <td>40</td> <td>clay blue</td> </tr> <tr> <td>40-45</td> <td>45</td> <td>sand</td> </tr> </tbody> </table>		From (ft.)	To (ft.)	Description and color of formation material	0-6	6	Surface sand	6-20	20	light clay	20-30	30	dark blue sand	30-40	40	clay blue	40-45	45	sand
From (ft.)	To (ft.)	Description and color of formation material																	
0-6	6	Surface sand																	
6-20	20	light clay																	
20-30	30	dark blue sand																	
30-40	40	clay blue																	
40-45	45	sand																	
9) CASING: Type: Old _____ New <input checked="" type="checkbox"/> Steel _____ Plastic <input checked="" type="checkbox"/> Other _____ Cemented from _____ ft. to _____ ft. Diameter (inches) _____ Setting From (ft.) _____ To (ft.) _____ Casing _____																			
10) SCREEN: Type _____ Perforated _____ Slotted _____ Diameter (inches) _____ Setting From (ft.) _____ To (ft.) _____ Slot Size _____																			
(Use reverse side if necessary)																			
7) COMPLETION (Check): Straight wall _____ Gravel packed _____ Other _____ Under reamed <u>Yes</u> Open Hole <u>Yes</u>																			
8) WATER LEVEL: Static level <u>4</u> ft. below land surface Date _____ Artesian pressure _____ lbs. per square inch Date _____ Depth to pump bowl, cylinder, jet, etc., _____ ft. below land surface.																			
11) WELL TESTS: Was a pump test made? Yes _____ No <input checked="" type="checkbox"/> If yes, by whom? _____ Yield: _____ gpm with _____ ft. drawdown after _____ hrs. Boiler test _____ gpm with _____ ft. drawdown after _____ hrs. Artesian flow _____ gpm Temperature of water _____																			
12) WATER QUALITY: Was a chemical analysis made? Yes _____ No <input checked="" type="checkbox"/> Did any strata contain undesirable water? Yes _____ No <input checked="" type="checkbox"/> Type of water? <u>Good</u> depth of strata <u>5 ft</u>																			
I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. NAME <u>MILTON MUNDINE</u> Water Well Drillers Registration No. <u>171</u> (Type or Print) ADDRESS <u>PO BOX 436 ROCKPORT TEXAS</u> (Street or RFD) (City) (State) (Signed) <u>Milton MUNDINE</u> <u>Same</u> (Water Well Driller) (Company Name)																			
Please attach electric log, chemical analysis, and other pertinent information, if available.																			

*Additional instructions on reverse side.

TWDB-CR-53

4840900547

MAP ID

2

Please use black ink.
Send original copy by
certified mail to the
Texas Department of Water Resources
P. O. Box 13087
Austin, Texas 78711

State of Texas
WATER WELL REPORT
ATTENTION OWNER: Confidentiality Privilege Notice on Reverse Side

Texas Water Well Drillers Board
P. O. Box 13087
Austin, Texas 78711

1) OWNER Don Walton (Name) Address Rt 1, Box 487D (Street or RFD) Lytle (City) TX (State) 78363 (Zip)

2) LOCATION OF WELL:
County San Patricio 2 miles in East direction from Lytle (Town)
(N.E., S.W., etc.)

Driller must complete the legal description to the right with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

☐ Legal description: Section No. _____ Block No. _____ Township _____
Abstract No. _____ Survey Name _____
Distance and direction from two intersecting section or survey lines _____

☒ See attached map. 65 Map on 83-06-7A

3) TYPE OF WORK (Check):
☒ New Well ☐ Deepening ☐ Reconditioning ☐ Plugging

4) PROPOSED USE (Check):
☒ Domestic ☐ Industrial ☐ Public Supply ☐ Irrigation ☐ Test Well ☐ Other _____

5) DRILLING METHOD (Check):
☒ Mud Rotary ☐ Air Hammer ☐ Driven ☐ Bored ☐ Air Rotary ☐ Cable Tool ☐ Jotted ☐ Other _____

6) WELL LOG:
Date drilled 8-9-84

DIAMETER OF HOLE		
Dis. (in.)	From (ft.)	To (ft.)
<u>6 3/4</u>	<u>Surface</u>	<u>85</u>

7) BOREHOLE COMPLETION:
☐ Open Hole ☒ Straight Wall ☐ Underreamed
☐ Gravel Packed ☐ Other _____
If Gravel Packed give interval . . . from _____ ft. to _____ ft.

8) CASING, BLANK PIPE, AND WELL SCREEN DATA:

From (ft.)	To (ft.)	Description and color of formation material	Dia. (in.)	New or Used	Steel (Plastic, etc.) Perf., Jotted, etc. Screen Mfg., if commercial	Sitting (ft.)		Gage Casing Screen
						From	To	
<u>0</u>	<u>20</u>	<u>sand</u>						
<u>20</u>	<u>25</u>	<u>shale</u>	<u>4 1/2 in.</u>		<u>Plastic</u>	<u>65</u>	<u>85</u>	<u>012</u>
<u>25</u>	<u>32</u>	<u>sand</u>						
<u>32</u>	<u>54</u>	<u>shale</u>						
<u>54</u>	<u>59</u>	<u>sand</u>						
<u>59</u>	<u>68</u>	<u>shale</u>						
<u>68</u>	<u>84</u>	<u>sand</u>						
<u>84</u>	<u>85</u>	<u>shale</u>						

9) CEMENTING DATA [Rule 319.44(b)]
Cemented from 0 ft. to 10 ft.
Method used _____
Cemented by _____

10) SURFACE COMPLETION
☒ Specified Surface Slab Installed [Rule 319.44(c)]
☐ Pitless Adapter Used [Rule 319.44(d)]
☐ Approved Alternative Procedure Used [Rule 319.71]

11) WATER LEVEL:
Static level 21 ft. below land surface Date 8-9-84
Artisan flow _____ gpm. Date _____

12) PACKERS: Type _____ Depth 85

13) TYPE PUMP:
☐ Turbine ☐ Jet ☐ Submersible ☐ Cylinder
☐ Other _____
Depth to pump bowls, cylinder, jet, etc., _____ ft.

14) WELL TESTS:
Type Test: ☐ Pump ☐ Bailor ☒ Jetted ☐ Estimated
Yield: 20 gpm with _____ ft. drawdown after _____ hrs.

15) WATER QUALITY:
Did you knowingly penetrate any strata which contained undesirable water? ☐ Yes ☒ No
If yes, submit "REPORT OF UNDESIRABLE WATER"
Type of water? _____ Depth of strata _____
Was a chemical analysis made? ☐ Yes ☒ No

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 12 will result in the log(s) being returned for completion and resubmission.

COMPANY NAME Wells Water Wells (Type or Print) Water Well Driller's License No. 543

ADDRESS 318 Kissling Robstown TX 78380
(Street or RFD) (City) (State) (Zip)

(Signed) Don Walton (Licensed Water Well Driller) (Signed) Dup (Registered Driller Trainee)
Please attach electric log, chemical analysis, and other pertinent information, if available.

For TOWR use only:
Well No. 83-15-24
Located on map Yes

TOWR 8303 (11/78/101)

DEPARTMENT OF WATER RESOURCES COPY

4840900545

MAP ID

3

Send original copy by certified mail to the Texas Department of Water Resources P. O. Box 13087 Austin, Texas 78711

State of Texas
WATER WELL REPORT
ATTENTION OWNER: Confidentiality Privilege Notice on Reverse Side

Texas Water Well Drillers Board
P. O. Box 13087
Austin, Texas 78711

1) OWNER Sun Exploration & Production Co Address P.O. Box 8993 Corpus Christi, TX 78412
(Name) (Street or RFD) (City) (State) (Zip)

2) LOCATION OF WELL:
County San Patricio 6 miles in East direction from Ingelside
(N.E., S.W., etc.) (Town)

☐ Legal description:
Section No. _____ Block No. _____ Township _____
Abstract No. _____ Survey Name _____
Distance and direction from two intersecting section or survey lines _____

☒ See attached map. 83-15-21

3) TYPE OF WORK (Check):
☒ New Well ☐ Deepening ☐ Reconditioning ☐ Plugging

4) PROPOSED USE (Check):
☒ Domestic ☐ Industrial ☐ Public Supply
☐ Irrigation ☐ Test Well ☐ Other _____

5) DRILLING METHOD (Check):
☒ Mud Rotary ☐ Air Hammer ☐ Driven ☐ Bored
☐ Air Rotary ☐ Cable Tool ☐ Jetted ☐ Other _____

6) WELL LOG:
Date drilled 9-4-84

DIAMETER OF HOLE	
Dia. (in.)	To (ft.)
9 7/8	Surface
	95

7) BOREHOLE COMPLETION:
☐ Open Hole ☐ Straight Wall ☐ Underreamed
☒ Gravel Packed ☐ Other _____
If Gravel Packed give interval ... from 30 ft. to 95 ft.

From (ft.)	To (ft.)	Description and color of formation material
0	4	Surface Soil
4	45	Gray Sand
45	71	Gray Shale & Sea Shale
71	95	Fine Sand

8) CASING, BLANK PIPE, AND WELL SCREEN DATA:

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.)	Gage Casing Screen
			From	To
5	N	Plastic Well Casing	0	71
5	N	.016 Gauge Well Screen PVC	71	95

CEMENTING DATA
Cemented from Surface ft. to 30 ft.
Method used POUR
Cemented by Richardson Water Well Drlg. Co., Inc.
(Company or Individual)

9) WATER LEVEL:
Static level 3 ft. below land surface Date 9-4-84
Artesian flow _____ gpm. Date _____

10) PACKERS: Type _____ Depth _____

11) TYPE PUMP:
☐ Turbine ☐ Jet ☒ Submersible ☐ Cylinder
☐ Other _____
Depth to pump bowls, cylinder, jet, etc., 84 ft.

12) WELL TESTS:
☐ Type Test ☐ Pump ☐ Bailor ☒ Jetted ☐ Estimated
Yield: 55 gpm with _____ ft. drawdown after _____ hrs.
84' of 1 1/2" airline w/185 CFM Air Compressor

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief.

COMPANY NAME Richardson Water Well Drlg. Co. Well Driller's License No. 1678
(Type or Print)

ADDRESS 808 Lincoln Alice Texas 78332
(Street or R.F.D.) (City) (State) (Zip)

(Signed) Tanya A. Richardson (Signed) Donald D. Smith
(Licensed Water Well Driller) (Registered Driller/Trainer)

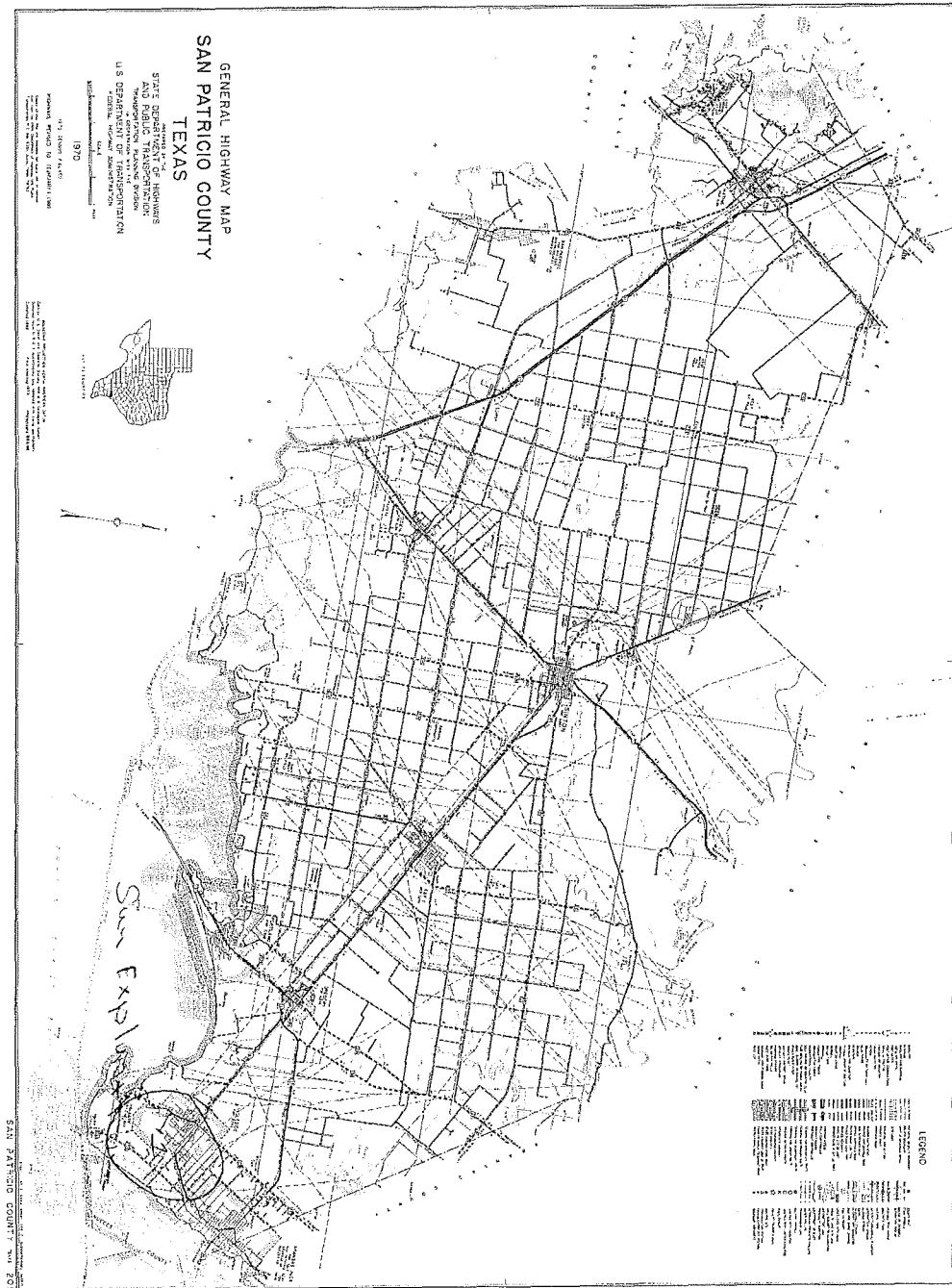
Please attach electric log, chemical analysis, and other pertinent information, if available.

For TDWR use only
Well No. 83-15-21
Located on map 83-15-21

TDWR-0392 (Rev. 5-27-82)

DEPARTMENT OF WATER RESOURCES COPY

4840900552



MAP ID

4

TEXAS WATER DEVELOPMENT BOARD

WELL SCHEDULE

Aquifer 007 Field No. 145 State Well No. 83-15-203
 Owner's Well No. _____ County San Patricio

1. Location: 1/4, 1/4 Sec. _____, Block _____ Survey _____

2. Owner: H. A. Stevens Address: Ingleside
 Tenant: _____ Address: _____
 Driller: _____ Address: _____

3. Elevation of 2nd is 11.96 ft. above msl, determined by alt., USGS

4. Drilled: 19 13; Dug, Cable Tool, Rotary, _____

5. Depth: Rept. 50 ft. Meas. _____ ft.

6. Completion: Open Hole, Straight Wall, Underreamed, Gravel Packed _____

7. Pump: Mfg. _____ Type Windmill
 No. Stages _____, Bowl Diam. _____ in., Setting _____ ft.
 Column Diam. _____ in., Length Tailpipe _____ ft.

8. Motor: Fuel _____ Make & Model _____ HP _____

9. Yield: Flow _____ gpm, Pump _____ gpm, Meas., Rept., Est. _____

10. Performance Test: Date _____ Length of Test _____ Made by _____
 Static Level _____ ft. Pumping Level _____ ft. Drawdown _____ ft.
 Production _____ gpm Specific Capacity _____ gpm/ft.

11. Water Level: 17.20 ft. 9-13-38 top csg which is 1.0 ft. above surface.
 _____ ft. 19 above surface.
 _____ ft. 19 below surface.
 _____ ft. 19 above surface.
 _____ ft. 19 below surface.

12. Use: Dom Stock Public Supply, Ind., Irr., Waterflooding, Observation, Not Used.

13. Quality: (Remarks on taste, odor, color, etc.) _____
 Temp. _____ °F, Date sampled for analysis 9-13-38 Laboratory USGS
 Temp. _____ °F, Date sampled for analysis _____ Laboratory _____
 Temp. _____ °F, Date sampled for analysis _____ Laboratory _____

14. Other data available as circled: Driller's Log, Radioactivity Log, Electric Log, Formation Samples, Pumping Test.

15. Record by: Johnson USGS Date 9-13 19 38

16. Source of Data _____
 Remarks: Copied 6-3-76 DBL

CASINO & BLANK PIPE			
Cemented From		ft. to	
Diam. (in.)	Type	Setting, ft.	
		from	to
<u>4</u>	<u>iron</u>		<u>50</u>

WELL SCREEN			
Screen Openings		Setting, ft.	
Diam. (in.)	Type	from to	

9-185-July 1935
Revised

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

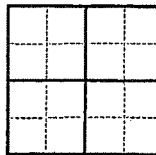
WATER RESOURCES BRANCH 83-15-203

WELL SCHEDULE

Date Sept 13, 1938 Field No. 577
Record by J. W. H. H. H. H. Office No. 145-
Source of data J. W. H. H. H. H.

1. Location: State Ill. County Scott
Map Sec 5 T. N R. 8 E. W
2. Owner: H. A. Slawson Address Ingleside
Tenant _____ Address _____
Driller Scott Address _____

3. Topography Flat
4. Elevation _____ ft. above _____ ft. below
5. Type: Dug, drilled, driven, bored, jetted 10.13
6. Depth: (Rept.) 50 ft. Meas. _____ ft.
7. Casing: Diam. 4 in., to _____ in., Type dr
Depth _____ ft., Finish Up to Bottom



8. Chief Aquifer _____ From _____ ft. to _____ ft.
Others _____
9. Water level 17.70 ft. (Rept.) 19.22 ft. (Meas.) above _____ ft. below surface
which is 1.0 ft. below surface
10. Pump: Type Hand Capacity _____ G. M.
Power: Kind Hand Horsepower _____
11. Yield: Flow _____ G. M., Pump _____ G. M., Meas., Rept. Est.
Drawdown _____ ft. after _____ hours pumping _____ G. M.
12. Use: (Dom., Stock) PS., RR., Ind., Irr., Obs. _____
Adequacy, permanence _____
13. Quality Good Temp. _____ °F.
Taste, odor, color _____ Sample Yes
Unfit for _____

14. Remarks: (Log, Analyses, etc.) Obs Well

(10)

4SW

July 1935
Revised

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES BRANCH

WELL SCHEDULE

Date Sept 13 1938 Field No. 577
Record by J. E. Jones Office No. 145
Source of data I. W. Hanson

1. Location: State Tex County San Patricio
Map Lat 5 South Comm Pk M

X 1/4 sec. T 8 R W
2. Owner: H. A. Stevens Address Ingleside
Tenant _____ Address _____
Driller E. J. Address _____

3. Topography Flat4. Elevation 11.96 ft above
below5. Type: Dug, drilled, driven, bored, jetted 19.136. Depth: 50 ft. Meas. _____ ft.7. Casing: Diam. 4 in. to _____ in. Type ironDepth _____ ft. Finish galv. pipe

8. Chief Aquifer _____ From _____ ft. to _____ ft.

Others _____

9. Water Level 10.70 ft. rept meas Sept 13 1938 above topCamping which is 1.0 ft. above below surface10. Pump: Type Cyl Capacity _____ G. M.Power: Kind windmill Horsepower _____

11. Yield: Flow _____ G. M., Pump _____ G. M., Meas. Rept. Est. _____

Drawdown _____ ft. after _____ hours pumping _____ G. M.

12. Use: Dom., Stock, PS., RR., Ind., Irr., Obs.

Adequacy, permanence _____

13. Quality Water Hard Temp _____ °F.Taste, odor, color _____ Sample Yes No

Unfit for _____

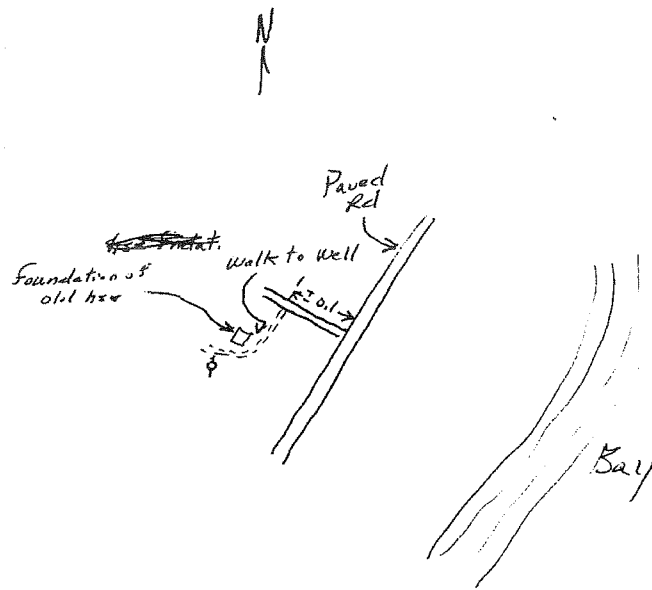
14. Remarks: (Log, Analyses, etc.) Owner request analysis

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Water Resources Branch

Water Level Measurements _____ Field No. _____
Owner Abilla Nelson Office No. 145
Tenant _____ County San Patricio
Location Lat 5, ALK-17 Type of well C.M.
Measuring Point Top 4" C.S. Elev. M.P. _____
Height of Meas. Point above land-surface datum 1.0 12.96

Date	Depth to water below meas. point	Ht. M.P. above L.S.D.	Depth to water below L.S.D.	Meas. by	Remarks (pumping, M.P. changed, etc.)
11-14-50	10.60	1.0	9.60	GHS	Hsc rapid
12-25-51	9.16	✓	8.16	✓	
1-15-52	8.89	0.6	8.29	GHS	Hsc increased
1-15-52	9.64	✓	9.04	BS	Low tide
2-15-52	6.01	✓	5.41	BS	
3-15-52	10.42	✓	9.82	BS	
4-15-52	9.34	✓	8.74	BS	
5-15-52	6.64	0.6	6.04	BS	M.P. from center of casing, windmill over
6-15-52	6.78	0.6	6.18	BS	



MAP ID

4

TEXAS WATER DEVELOPMENT BOARD
WATER LEVEL OBSERVATION WELL REPORT

STATE WELL NUMBER: 8315203

CURRENT DATE: Oct 5 1992

PREVIOUS WELL NUMBER: 145 ¹⁶

YEAR RECORD BEGINS: 1938

WELL LOCATION: LAT: 27 51 ^N

ELEVATION OF LAND SURFACE: 11

LONG: 097 11 ⁰²

DEPTH OF WELL: 50

WELL USE: H S ¹⁸

DATE OF CURRENT MEASUREMENT MO DAY YEAR	CURRENT DEPTH TO WATER FROM LAND SURFACE	CHANGE IN LEVEL SINCE LAST STATIC MEASUREMENT	MEASUREMENT NUMBER	ELEVATION OF WATER LEVEL	MEASURING AGENCY	MEASUREMENT METHOD	REMARKS
09/13/1938	-11.70		01	1	12		01
03/18/1940	-10.59	1.11	01		12		01
08/06/1940	-10.58	0.01	01		12		01
11/21/1940	-10.32	0.26	01	1	12		01
02/27/1941	-10.12	0.20	01	1	12		01
05/17/1941	-8.01	2.11	01	3	12		01
05/31/1941	-7.47	0.54	01	4	12		01
09/12/1941	-9.55	-2.08	01	1	12		01
01/21/1942	-9.16	0.39	01	2	12		01
06/27/1942	-9.02	0.14	01	2	12		01
11/07/1945	-7.06	1.96	01	4	12		01
12/26/1945	-6.86	0.20	01	4	12		01
11/21/1947	-7.87	-1.01	01	3	12		01
11/16/1949	-7.19	0.68	01	4	12		01
11/14/1950	-9.60	-2.41	01	1	12		01
11/21/1951	-8.16	1.44	01	3	12		01
12/08/1953	-8.29	-0.13	01	3	12		01
12/13/1954	-9.04	-0.75	01	2	12		01
12/05/1955	-5.41	3.63	01	6	12		01
12/05/1956	-9.82	-4.41	01	1	12		01
12/10/1957	-8.74	1.08	01	2	12		01
11/19/1959	-6.04	2.70	01	5	12		01
09/29/1960	-6.18	-0.14	01	5	01	1	
02/13/1963	-7.40	-1.22	01	4	01	1	
03/17/1964	-8.13	-0.73	01	3	01	1	

AQUIFER: GULF COAST AQUIFER

BASIN : San Antonio-Nueces Rivers

COUNTY : San Patricio

WELL CLASS AND NUMBER: HISTORICAL 8315203

TEXAS WATER DEVELOPMENT BOARD

WELL SCHEDULE

Aquifer 007 Field No. 148 State Well No. 83-15-206
 Owner's Well No. _____ County San Patricio

1. Location: 1/4, 1/4 Sec., Block _____ Survey _____

2. Owner: W. T. Harris Address: Box 84 Aransas Pass
 Tenant: _____ Address: _____
 Driller: _____ Address: _____

3. Elevation of Lsd is 9.57 ft. above msl, determined by alt, USGS

4. Drilled: 19 36; Dug, Cable Tool, Rotary, _____

5. Depth: Rept. 51 ft. Meas. _____ ft.

6. Completion: Open Hole, Straight Wall, Underreamed, Gravel Packed _____

7. Pump: Mfr. _____ Type _____
 No. Stages _____, Bowl Dia. _____ in., Setting _____ ft.
 Column Dia. _____ in., Length Tailpipe _____ ft.

8. Motor: Fuel _____ Make & Model _____ HP _____

9. Yield: Flow _____ gpm, Pump _____ gpm, Meas., Rept., Est. _____

10. Performance Test: Date _____ Length of Test _____ Made by _____
 Static Level _____ ft. Pumping Level _____ ft. Drawdown _____ ft.
 Production _____ gpm Specific Capacity _____ gpm/ft.

11. Water Level: 22.6 ft. Rept. 19 below Lsd which is _____ ft. above surface.
 _____ ft. Rept. 19 below which is _____ ft. above surface.
 _____ ft. Rept. 19 below which is _____ ft. above surface.
 _____ ft. Rept. 19 below which is _____ ft. above surface.
 _____ ft. Rept. 19 below which is _____ ft. above surface.

12. Use: Dom. Stock Public Supply, Ind., Irr., Waterflooding, Observation, Not Used, _____

13. Quality: (Remarks on taste, odor, color, etc.) _____
 Temp. _____ °F, Date sampled for analysis 9-13-38 Laboratory USGS
 Temp. _____ °F, Date sampled for analysis _____ Laboratory _____
 Temp. _____ °F, Date sampled for analysis _____ Laboratory _____

14. Other data available as circled: Driller's Log, Radioactivity Log, Electric Log, _____
 Formation Samples, Pumping Test, _____

15. Record by: Johnson USGS Date 9-13 1938
 Source of Data owner

16. Remarks: copied 6-3-76 DBC

CASING & BLANK PIPE			
Cemented From		ft. to	
Diam. (in.)	Type	Setting, ft.	
		from	to
<u>1 1/2</u>	<u>iron</u>		<u>51</u>

WELL SCREEN			
Screen Openings			
Diam. (in.)	Type	Setting, ft.	
		from	to

MAP ID

4

TEXAS WATER DEVELOPMENT BOARD
WATER LEVEL OBSERVATION WELL REPORT

STATE WELL NUMBER: 8315206

CURRENT DATE: Oct 5 1992

PREVIOUS WELL NUMBER: 148

YEAR RECORD BEGINS: 1940

WELL LOCATION: LAT: 27 51 195 3

ELEVATION OF LAND SURFACE: 9

LONG: 097 11 15 15

DEPTH OF WELL: 51

WELL USE: S

DATE OF CURRENT MEASUREMENT MO DAY YEAR	CURRENT DEPTH TO WATER FROM LAND SURFACE	CHANGE IN LEVEL SINCE LAST STATIC MEASUREMENT	MEASUREMENT NUMBER	ELEVATION OF WATER LEVEL	MEASURING AGENCY	MEASUREMENT METHOD	REMARKS
03/18/1940	-10.15		01	1	12		01
11/21/1940	-10.08	0.07	01	1	12		01
02/27/1941	-9.50	0.58	01	1	12		01
05/17/1941	-8.54	0.96	01		12		01
05/31/1941	-8.10	0.44	01	1	12		01
01/21/1942	-9.31	-1.21	01		12		01
11/08/1945	-7.78	1.53	01	1	12		01
12/26/1945	-7.69	0.09	01	1	12		01
11/21/1947	-7.60	0.09	01	1	12		01
11/16/1949	-7.30	0.30	01	2	12		01
11/14/1950	-8.21	-0.91	01	1	12		01
11/21/1951	-8.28	-0.07	01	1	12		01
12/08/1953	-8.12	0.16	01	1	12		01
12/13/1954	-8.72	-0.60	01		12		01
12/05/1955	-9.43	-0.71	01		12		01
12/05/1956	-9.37	0.06	01		12		01
12/10/1957	-8.55	0.82	01		12		01
11/19/1959	-6.91	1.64	01	2	12		01

AQUIFER: GULF COAST AQUIFER

BASIN : San Antonio-Nueces Rivers

COUNTY : San Patricio

WELL CLASS AND NUMBER: HISTORICAL 8315206

9-185-July 1935
Revised

45W

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES BRANCH 83-15-206

WELL SCHEDULE

Date Sept 13, 1938 Field No. 575
 Record by C. E. Galloway Office No. 148
 Source of data W. T. Harris

1. Location: State Texas County San Patricio
 Map S. Lot 83 Block L

1/4 sec. T N R E W

2. Owner: W. T. Harris Address Araucaria Pass

Tenant " Address Box 84

Driller " Address "

3. Topography Flat

4. Elevation 44 ft. above 44 ft. below

5. Type: Dug, drilled, driven, bored, jetted 10.36

6. Depth: (Rept.) 51 ft. Meas. 51 ft.

7. Casing: Diam. 1 1/2 in. to 1 1/2 in. Type 2 1/2"

Depth 51 ft. Finish Tap to 13 ft. in

8. Chief Aquifer " From " ft. to " ft.

Others "

9. Water level 226 ft. (rept. 226 ft. above 226 ft. below 226 ft. above surface 226 ft. below surface)

10. Pump: Type Cyl Capacity " G. M.

Power: Kind Windmill Horsepower "

11. Yield: Flow " G. M., Pump " G. M., Meas., Rept. Est.

Drawdown " ft. after " hours pumping " G. M.

12. Use: Dom. (Stock, PS., RR., Ind., Irr., Obs.) "

Adequacy, permanence None

13. Quality Good. Not used for 10 min. Temp. " °F.

Taste, odor, color " Sample Yes No

Unfit for "

14. Remarks: (Log, Analyses, etc.) Owner requests analyses

Obs Well

MAP ID

5

Send original copy by certified mail to the Texas Water Development Board P. O. Box 13087 Austin, Texas 78711

State of Texas

WATER WELL REPORT

For TWDB use only
Well No. 34
Located on map
Receipt No. 34

1) OWNER:
Person having well drilled U.N.L. Oil Co., Inc. Address Drawer 970 (City) (State)
Landowner Shane Address Ingleside, Tx. 78362 (City) (State)

2) LOCATION OF WELL:
County San Patricio 4 miles in E direction from Ingleside (Town)
Locate by sketch map showing landmarks, roads, creeks, or Give legal location with distances and directions from adjacent sections or survey lines.
hwy number, etc.*

(Use reverse side if necessary) (N.E., S.W., etc.) (Town)
Labor _____ League _____
Block _____ Survey _____
Abstract No. _____
(N½ NE¼ SW¼ SE¼) of Section _____

3) TYPE OF WORK (Check):
☒ New Well ☐ Deepening ☐ Reconditioning ☐ Plugging

4) PROPOSED USE (Check):
☒ Domestic ☐ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other

5) TYPE OF WELL (Check):
☒ Rotary ☐ Driven ☐ Dug
☐ Cable ☐ Jetted ☐ Bored

6) WELL LOG:
Diameter of hole 6 1/8 in. Depth drilled 80 ft. Depth of completed well 80 ft. Date drilled 1-31-78
All measurements made from 0 ft. above ground level.

From (ft.)	To (ft.)	Description and color of formation material
	<u>5</u>	<u>Sand</u>
<u>5</u>	<u>15</u>	<u>Shale</u>
<u>15</u>	<u>33</u>	<u>sand</u>
<u>33</u>	<u>45</u>	<u>shale</u>
<u>45</u>	<u>50</u>	<u>sand</u>
<u>50</u>	<u>62</u>	<u>shale</u>
<u>62</u>	<u>76</u>	<u>sand</u>
<u>76</u>	<u>80</u>	<u>shale</u>

9) CASING:
Type: Old ☐ New ☒ Steel ☐ Plastic ☐ Other _____
Cemented from _____ ft. to _____ ft.
Diameter (inches) _____ Setting From (ft.) _____ To (ft.) _____ Gauge _____
4 1/2 0 80 Sched. 40

10) SCREEN:
Type _____
Perforated ☐ Slotted ☒
Diameter (inches) _____ Setting From (ft.) _____ To (ft.) _____ Slot Size _____
4 1/2 60 80 1.012

7) COMPLETION (Check):
☒ Straight wall ☐ Gravel packed ☐ Other _____
☐ Under reamed ☐ Open Hole

8) WATER LEVEL:
Static level 14 ft. below land surface Date 1-31-78
Artesian pressure _____ lbs. per square inch Date _____
Depth to pump bowls, cylinder, jet, etc., _____ ft. below land surface.

11) WELL TESTS:
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gpm with _____ ft. drawdown after _____ hrs.
Bailer test _____ gpm with _____ ft. drawdown after _____ hrs.
Artesian flow _____ gpm
Temperature of water _____

12) WATER QUALITY:
Was a chemical analysis made? Yes ☐ No ☐
Did any strata contain undesirable water? Yes ☐ No ☒
Type of water? _____ depth of strata 20 ft.

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief.

NAME Ben H. Helty Water Well Drillers Registration No. 543
(Type or Print)
ADDRESS 318 Kissling Rotterdam, Tx. 78380 (City) (State)
(Street or RFD)
(Signed) Ben H. Helty Helty Water Wells
(Water Well Driller) (Company Name)

Please attach electric log, chemical analysis, and other pertinent information, if available.

*Additional instructions on reverse side.

4840900533

MAP ID

6

Send original copy by certified mail to the Texas Water Development Board, P. O. Box 13087, Austin, Texas 78711

State of Texas

WATER WELL REPORT

For TWDB use only
Well No. _____
Located on map _____
Hereofval: _____

3A

1) OWNER:
Person having well drilled William Moore Address P.O. Box 901 (City) (State)
(Name) (Street or RFD) (City) (State)
Landowner Same Address Ingleside, TX 78362 (City) (State)
(Name) (Street or RFD) (City) (State)

2) LOCATION OF WELL:
County San Patricio _____ miles in 4 direction from Ingleside
(Name) (N.E., S.W., etc.) (Town)
Locate by sketch map showing landmarks, roads, creeks, or Give legal location with distances and directions from adjacent sections or survey lines.
Locality on 4th st. ROCKPORT
35 WORTH
X ARMY'S PASS
X GREGORY
X (Use reverse side if necessary) WINGERS POND
Abstract No. _____
(NW 1/4, NE 1/4, SW 1/4, SE 1/4) of Section _____

3) TYPE OF WORK (Check):
☒ New Well ☐ Deepening ☐ Reconditioning ☐ Plugging

4) PROPOSED USE (Check):
☒ Domestic ☐ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other

5) TYPE OF WELL (Check):
☒ Rotary ☐ Driven ☐ Dug ☐ Cable ☐ Jetted ☐ Bored

6) WELL LOG:
Diameter of hole 6 1/8 in. Depth drilled 70 ft. Depth of completed well 70 ft. Date drilled 3-30-78
All measurements made from 0 ft. above ground level.

From (ft.)	To (ft.)	Description and color of formation material
	<u>21</u>	<u>clay</u>
<u>21</u>	<u>26</u>	<u>sand</u>
<u>26</u>	<u>43</u>	<u>shale</u>
<u>43</u>	<u>46</u>	<u>sand</u>
<u>46</u>	<u>62</u>	<u>shale</u>
<u>62</u>	<u>70</u>	<u>sand</u>

9) CASING:
Type: ☒ Old ☒ New ☐ Steel ☒ Plastic ☐ Other
Cemented from _____ ft. to _____ ft.
Diameter (inches) _____ Setting From (ft.) _____ To (ft.) _____ Casing _____

10) SCREEN:
Type: ☒ Perforated ☒ Slotted
Diameter (inches) _____ Setting From (ft.) _____ To (ft.) _____ Slot Size _____

7) COMPLETION (Check):
☒ Straight well ☐ Gravel packed ☐ Other
☐ Under cemented ☐ Open Hole

8) WATER LEVEL:
Static level 10 ft. below land surface Date 3-30-78
Artesian pressure _____ lbs. per square inch Date _____
Depth to pump bowls, cylinder, jet, etc., _____ ft. below land surface.

11) WELL TESTS:
Was a pump test made? Yes No If yes, by whom?
Yield: _____ gpm with _____ ft. drawdown after _____ hrs.
Ratier test _____ gpm with _____ ft. drawdown after _____ hrs.
Artesian flow _____ gpm
Temperature of water _____

12) WATER QUALITY:
Was a chemical analysis made? Yes No
Did any strata contain undesirable water? Yes No
Type of water? _____ depth of strata 20 ft.

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief.

NAME Bernie H. Kelly Water Well Drillers Registration No. 543
(Type or Print)
ADDRESS 318 Kieseling Robstown, TX 78380 (City) (State)
(Street or RFD)
(Signed) Bernie H. Kelly Kelly Water Wells (Water Well Driller) (Company Name)

Please attach electric log, chemical analysis, and other pertinent information, if available.

*Additional instructions on reverse side.

TWDB-WDB

4840900531

53

MAP ID

7

TEXAS WATER DEVELOPMENT BOARD

WELL SCHEDULE

Aquifer 007 Field No. 139 State Well No. 83-15-204
 Owner's Well No. _____ County San Patricio

1. Location: 1/4, 1/4 Sec., Block _____ Survey _____

2. Owner: H. Blagg Address: Aransas Pass
 Tenant: _____ Address: _____
 Driller: _____ Address: _____

3. Elevation of 43d is 8.03 ft. above sea, determined by alt, USGS

4. Drilled: 19 37; Dug, Cable Tool, Rotary, _____

5. Depth: Rept. 44 ft. Meas. _____ ft.

6. Completion: Open Hole, Straight Well, Underreamed, Gravel Packed

7. Pump: Mfg. _____ Type Windmill
 No. Stages _____, Bowls Diam. _____ in., Setting _____ ft.
 Column Diam. _____ in., Length Tailpipe _____ ft.

8. Motor: Fuel _____ Make & Model _____ HP _____

9. Yield: Flow _____ gpm, Pump _____ gpm, Meas., Rept., Est. _____

10. Performance Test: Date _____ Length of Test _____ Made by _____
 Static Level _____ ft. Pumping Level _____ ft. Drawdown _____ ft.
 Production _____ gpm Specific Capacity _____ gpm/ft.

11. Water Level: _____ ft. rept. _____ 19 _____ above _____ which is _____ ft. above surface.
 _____ ft. rept. _____ 19 _____ below _____ which is _____ ft. above surface.
 _____ ft. rept. _____ 19 _____ below _____ which is _____ ft. above surface.
 _____ ft. rept. _____ 19 _____ below _____ which is _____ ft. above surface.
 _____ ft. rept. _____ 19 _____ below _____ which is _____ ft. above surface.

12. Use: Dom. Stock Public Supply, Ind., Irr., Waterflooding, Observation, Not Used, _____

13. Quality: (Remarks on taste, odor, color, etc.) _____
 Temp. _____ °F, Date sampled for analysis 9-13-38 Laboratory USGS
 Temp. _____ °F, Date sampled for analysis _____ Laboratory _____
 Temp. _____ °F, Date sampled for analysis _____ Laboratory _____

14. Other data available as circled: Driller's Log, Radioactivity Log, Electric Log, Formation Samples, Pumping Test, _____

15. Record by: Johnson Date 9-13 19 38
 Source of Data owner

16. Remarks: Copied 6-3-76 DBC

CASING & BLANK PIPE			
Cemented From		ft. to	
Diam. (in.)	Type	Setting, ft. from	to
3	iron		44

WELL SCREEN			
Screen Openings			
Diam. (in.)	Type	Setting, ft. from to	

MAP ID

7

TEXAS WATER DEVELOPMENT BOARD
WATER LEVEL OBSERVATION WELL REPORT

STATE WELL NUMBER: 8315204

CURRENT DATE: Oct 5 1992

PREVIOUS WELL NUMBER: 139

YEAR RECORD BEGINS: 1938

WELL LOCATION: LAT: 27 52 14 10

ELEVATION OF LAND SURFACE: 8

LONG: 097 10 18

DEPTH OF WELL: 44

WELL USE: H S

DATE OF CURRENT MEASUREMENT MO DAY YEAR	CURRENT DEPTH TO WATER FROM LAND SURFACE	CHANGE IN LEVEL SINCE LAST STATIC MEASUREMENT	MEASUREMENT NUMBER	ELEVATION OF WATER LEVEL	MEASURING AGENCY	MEASUREMENT METHOD	REMARKS
09/13/1938	-4.60		01	3	12		01
12/07/1940	-4.33	0.27	01	4	12		01
02/27/1941	-3.50	0.83	01	5	12		01
05/18/1941	-3.62	-0.12	01	4	12		01
05/31/1941	-2.34	1.28	01	6	12		01
09/12/1941	-4.91	-2.57	01	3	12		01
01/21/1942	-4.07	0.84	01	4	12		01
06/27/1942	-4.09	-0.02	01	4	12		01
11/07/1945	-0.60	3.49	01	7	12		01
12/28/1945	-2.94	-2.34	01	5	12		01
11/21/1947	-2.44	0.50	01	6	12		01
11/16/1949	-3.26	-0.82	01	5	12		01
11/14/1950	-4.94	-1.68	01	3	12		01
11/21/1951	-4.15	0.79	01	4	12		01

AQUIFER: GULF COAST AQUIFER

BASIN : San Antonio-Nueces Rivers

COUNTY : San Patricio

WELL CLASS AND NUMBER: HISTORICAL 8315204

9-185-July 1935
Revised

2345W

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES BRANCH 83-15-204

WELL SCHEDULE

Date Sept 12, 1938 Field No. 573
 Record by H. P. Salas Office No. 139
 Source of data H. P. Salas

1. Location: State Ill. County San Joaquin
 Map Section 5 T 4 sec. 4 N 8 R 6 E W
2. Owner: H. P. Salas Address Arroyo
 Tenant None Address None
 Driller None Address None
3. Topography Rolling
4. Elevation 5.8 ft. above None below
5. Type: Dug, drilled, driven, bored, jetted 1938
6. Depth: Rept. 5.8 ft. Meas. None ft.
7. Casing: Diam. 3 in. to None in. Type None
 Depth None ft. Finish None
8. Chief Aquifer None From None ft. to None ft.
 Others None
9. Water level 5.8 ft. rept. Sept 12 1938 above None below None
 which is None ft. above None below surface
10. Pump: Type None Capacity None G. M.
 Power: Kind Windmill Horsepower None
11. Yield: Flow None G. M., Pump None G. M., Meas., Rept. Est.
 Drawdown None ft. after None hours pumping None G. M.
12. Use: Dom., Stock, P.S., RR., Ind., Irr., Obs.
 Adequacy, Permanence None
13. Quality Bad Temp None °F.
 Taste, odor, color Yellow Sample Yes
 Unfit for None
14. Remarks: (Log, Analyses, etc.)
Owner requested analysis

Obs Well

MAP ID

8

Send original copy by certified mail to the Texas Water Development Board, P. O. Box 13087, Austin, Texas 78711

State of Texas

WATER WELL REPORT

For WDR use only
Well No. 83-1524
Located on map 2-2
Received: 7-7-74

1) OWNER:
Person having well drilled Don Breithaupt Address Box 464 D - Ingleside Texas
(Name) (Street or RFD) (City) (State)
Landowner (Same) Address _____
(Name) (Street or RFD) (City) (State)

2) LOCATION OF WELL:
County San Patricio Co miles in _____ direction from _____
(N.E., S.W., etc.) (Town)
Locate by sketch map showing landmarks, roads, creeks, highway number, etc.*
1 well
North
(Use reverse side if necessary)
Give legal location with distances and directions from adjacent sections or survey lines.
Labor _____ League _____
Block _____ Survey _____
Abstract No. _____
(Not NE, SW, SE, etc.) of Section _____

3) TYPE OF WELL (Check):
☒ New Well ☐ Deepening ☐ Reconditioning ☐ Plugging
4) PURPOSE OF WELL (Check):
☒ Domestic ☐ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other
5) TYPE OF WELL (Check):
☒ Rotary ☐ Driven ☐ Dug
☐ Cable ☐ Jetted ☐ Bored

6) WELL LOG:
Diameter of hole 7 in. Depth drilled 73 ft. Depth of completed well 40 ft. Date drilled 9-16
All measurements made from 1 ft. above ground level.

From (ft.)	To (ft.)	Description and color of formation material
		<u>0 - 20 Clay</u>
		<u>20 - 40 sand</u>
		<u>40 - 53 Clay</u>
		<u>53 - 73 sand</u>

9) CASING:
Type: Old _____ New _____ Steel ☒ Plastic ☐ Other _____
Cemented from _____ ft. to _____ ft.
Diameter (inches) _____ From (ft.) _____ To (ft.) _____ Gage _____
4 -1 to 20 Sch 40

10) SCREEN:
Type: Sch 40
Perforated _____ Slotted ☒
Diameter (inches) _____ From (ft.) _____ To (ft.) _____ Slot Size _____
4 20 to 40 .019

(Use reverse side if necessary)

7) COMPLETION (Check):
☐ Straight wall ☒ Gravel packed ☐ Other _____
☐ Under reamed ☐ Open Hole

8) WATER LEVEL:
Static level 10 ft. below land surface Date 9-19
Artesian pressure _____ lbs. per square inch Date _____
Depth to pump bowls, cylinder, jet, etc., _____ ft. below land surface.

11) WELL TESTS:
Was a pump test made? Yes ☐ No ☒ If yes, by whom? _____
Yield: _____ gpm with _____ ft. drawdown after _____ hrs.
Miller test _____ gpm with _____ ft. drawdown after _____ hrs.
Artesian flow _____ gpm
Temperature of water _____

12) WATER QUALITY:
Was a chemical analysis made? Yes ☐ No ☒
Did any strata contain undesirable water? Yes ☐ No ☒
Type of water? Salt depth of strata 52 to 73

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief.

NAME Cecil G Metcalf Water Well Drillers Registration No. 1742
(Type or Print)
ADDRESS 721 SO McCampbell Aransas Pass Tex
(Street or RFD) (City) (State)
(Signed) Cecil G Metcalf D & M Drilling
(Water Well Driller) (Company Name)

Please attach electric log, chemical analysis, and other pertinent information, if available.

*Additional instructions on reverse side.

TWDS-WDB

4840900710

MAP ID

9

83-15-2E

Send original copy by certified mail to the Texas Water Development Board, P. O. Box 13087, Austin, Texas 78711

State of Texas
WATER WELL REPORT

For TWDB use only
Well No. 83-15-2E
Located on map 24
Recorded 7/7/7
etc

1) OWNER:
Person having well drilled Frank W. Welty Address P.O. Box 2487
(Name) (Street or RFD) (City) (State)
Landowner Same Address Corpus Christi, TX 78403
(Name) (Street or RFD) (City) (State)

2) LOCATION OF WELL:
County San Patricio _____ miles in 2 direction from Angloville
(Name) (H.W., S.W., etc.) (Town)
Locate by sketch map showing landmarks, roads, creeks, highway number, etc. On 4th St in Aransas Pass
Give legal location with distances and directions from adjacent sections or survey lines.
Labor _____ League _____
Block _____ Survey _____
Abstract No. _____
(Use reverse side if necessary) 632 WELL IN S.E. 1/4 S. 20E 35 ARANSAS PAIS
(N.W. NE. S.W. SE) of Section _____

3) TYPE OF WORK (Check):
☒ New Well ☐ Deepening ☐ Reconditioning ☐ Plugging

4) PROPOSED USE (Check):
☒ Domestic ☐ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other

5) TYPE OF WELL (Check):
☒ Rotary ☐ Driven ☐ Dug
☐ Cable ☐ Jetted ☐ Bored

6) WELL LOG:
Diameter of hole 6 7/8 in. Depth drilled 80 ft. Depth of completed well 80 ft. Date drilled 4-22-74
All measurements made from 0 ft. above ground level.

From (ft.)	To (ft.)	Description and color of formation material
19	24	
24	31	
31	46	
46	52	
52	59	
59	80	

(Use reverse side if necessary)

7) COMPLETION (Check):
☒ Straight well ☐ Gravel packed ☐ Other
☐ Under reamed ☐ Open Hole

8) WATER LEVEL:
Static level 18 ft. below land surface Date 4-23-74
Artesian pressure _____ lbs. per square inch Date _____
Depth to pump bowls, cylinder, jet, etc., _____ ft. below land surface.

9) CASING:
Type: Old ☒ New ☐ Steel ☒ Plastic ☐ Other
Cemented from _____ ft. to _____ ft.
Diameter (inches) _____ Setting From (ft.) _____ To (ft.) _____ Gauge _____

10) SCREEN:
Type: ☒ Perforated ☐ Slotted
Diameter (inches) _____ Setting From (ft.) _____ To (ft.) _____ Slot Size _____

11) WELL TESTS:
Was a pump test made? Yes No If yes, by whom?
Yield: _____ gpm with _____ ft. drawdown after _____ hrs.
Boiler test _____ gpm with _____ ft. drawdown after _____ hrs.
Artesian flow _____ gpm
Temperature of water _____

12) WATER QUALITY:
Was a chemical analysis made? Yes No
Did any strata contain undesirable water? Yes No
Type of water? _____ depth of strata 20 ft

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief.

NAME BEN H. WELTY Water Well Drillers Registration No. 543
(Type or Print)
ADDRESS 318 KISSLING ROB. STOWN, TX. 78380
(Street or RFD) (City) (State)
(Signed) Benny Welty Welty Water Wellers
(Water Well Driller) (Company Name)

Please attach electric log, chemical analysis, and other pertinent information, if available.

*Additional instructions on reverse side.

TWDB-2008

4840900549

Please use black ink.

TNRCC-0100 (Rev. 11-01-94)

4840900535

TEXAS WATER DEVELOPMENT BOARD

WELL SCHEDULE

Aquifer 007 Field No. 138 State Well No. 83 15 202
 Owner's Well No. _____ County San Patricio

1. Location: 1/4, 1/4 Sec. _____, Block _____ Survey _____

2. Owner: J. F. Gambill Address: Aranzas Pass
 Tenant: _____ Address: _____
 Driller: MARVIN JONES Address: _____

3. Elevation of Top is 12.46 ft. above msl, determined by alt, USGS

4. Drilled: 19 36; Dug, Cable Tool, Rotary, _____

5. Depth: Rept. 36 ft. Meas. _____ ft.

6. Completion: Open Hole, Straight Wall, Underreamed, Gravel Packed

7. Pump: Mfr. _____ Type hand-pump
 No. Stages _____, Bowl Diam. _____ in., Setting _____ ft.
 Column Diam. _____ in., Length Tailpipe _____ ft.

8. Motor: Fuel _____ Make & Model _____ HP _____

9. Yield: Flow _____ gpm, Pump _____ gpm, Meas., Rept., Est. _____

10. Performance Test: Date _____ Length of Test _____ Made by _____
 Static Level _____ ft. Pumping Level _____ ft. Drawdown _____ ft.
 Production _____ gpm Specific Capacity _____ gpm/ft.

11. Water Level: 11.61 ft. Rept. 6-26 1938 top 4" CSG which is _____ ft. above surface.
 _____ ft. Rept. _____ 19 _____ above _____ ft. above surface.
 _____ ft. Rept. _____ 19 _____ below _____ ft. above surface.
 _____ ft. Rept. _____ 19 _____ below _____ ft. above surface.
 _____ ft. Rept. _____ 19 _____ below _____ ft. above surface.

12. Use: ☒ Public Supply, Ind., Irr., Waterflooding, Observation, Not Used, _____

13. Quality: (Remarks on taste, odor, color, etc.) _____
 Temp. _____ °F, Date sampled for analysis 6-26-38 Laboratory USGS
 Temp. _____ °F, Date sampled for analysis _____ Laboratory _____
 Temp. _____ °F, Date sampled for analysis _____ Laboratory _____

14. Other data available as circled: Driller's Log, Radioactivity Log, Electric Log, _____
 Formation Samples, Pumping Test, _____

15. Record by: Cromack USGS Date 6-26 1938

16. Remarks: Source of Data owner
Copied 6-3-76 DBC

CASING & BLANK PIPE			
Cemented From		ft. to	
Diam. (in.)	Type	Setting, ft.	
		from	to
4	iron		36

WELL SCREEN			
Screen Openings			
Diam. (in.)	Type	Setting, ft.	
		from	to

(9)

9-185-July 1935
RevisedUNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES BRANCH 83-15-202

WELL SCHEDULE

Date 6-26- 1938 Field No. 526
 Record by GERALD H. CROMBIE Office No. 138
 Source of data J. E. Gambill

1. Location: State Tex. County San Patricio
 Map Nicar Lot 4 Blk. R.
M. Campbell Sub. T. Div. N R E W
 2. Owner: J. E. Gambill Address Aransas Pass
 Tenant _____ Address _____
 Driller Marvin Jones Address _____

3. Topography Sand dunes

4. Elevation _____ ft. above _____ below

5. Type: Dug, drilled, driven, bored, jetted _____ 19366. Depth: Rept. 36 ft. Meas. _____ ft.7. Casing: Diam. 4 in., to _____ in., Type 120Depth _____ ft., Finish Top to bottom8. Chief Aquifer Hard water From 20 ft. to _____ ft.Others Thin blue clay 20-369. Water level 11.61 ft. rept. 6/26/ 1938 above top below _____4 120 CSY which is _____ ft. above _____ below surface10. Pump: Type Cyl Capacity _____ G. M.Power: Kind Hand Horsepower _____

11. Yield: Flow _____ G. M., Pump _____ G. M., Meas., Rept. Est. _____

Drawdown _____ ft. after _____ hours pumping _____ G. M.

12. Use: Dom. Stock, PS., RR., Ind., Irr., Obs. _____Adequacy, permanence Never fails13. Quality Soft Temp _____ °F.Taste, odor, color Slightly green Sample Yes No

Unfit for _____

14. Remarks: (Log, Analyses, etc.) _____

Obs. Well

9

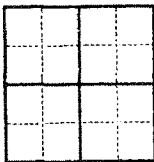
9-185-July 1935
RevisedUNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES BRANCH

WELL SCHEDULE

Date 6-26- 1938 Field No. 526
 Record by GERALD H. CRONLICK Office No. 138
 Source of data J. F. Gambill

1. Location: State Tex. County San Patricio
 Map NE 1/4 Sec 4 Blk. R.
NE 1/4 Sec 4 Blk. R. Sub T Riv. N S R E W
 2. Owner: J. F. Gambill Address Aransas Pass
 Tenant _____ Address _____
 Driller Morris Jones Address _____
 3. Topography Sand dunes
 4. Elevation 12.46 ft. above
 below
 5. Type: Dug, drilled, driven, bored, jetted _____ 1936
 6. Depth: Rept. 36 ft. Meas. _____ ft.
 7. Casing: Diam. 4 in. to _____ in. Type iron
 Depth _____ ft. Finish top to bottom
 8. Chief Aquifer Hard water From 20 ft. to _____ ft.
 Others Thin blue clay 20-36
 9. Water level 11.61 ft. rept. 6/26/ 1938 above below top
4 11.61 59 which is _____ ft. above
 below surface
 10. Pump: Type Cyl. Capacity _____ G. M.
 Power: Kind hand Horsepower _____
 11. Yield: Flow _____ G. M., Pump _____ G. M., Meas., Rept. Est.
 Drawdown _____ ft. after _____ hours pumping _____ G. M.
 12. Use: Dom. Stock, PS., RR., Ind., Irr., Obs.
 Adequacy, permanence Never fails
 13. Quality Salt Temp _____ °F.
 Taste, odor, color Slightly green Sample Yes
 Unfit for _____
 14. Remarks: (Log, Analyses, etc.) _____



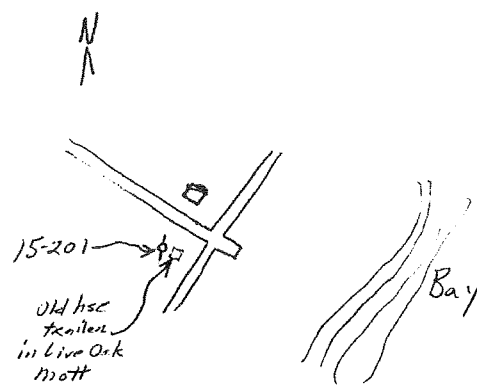
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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Water Resources Branch

Water Level Measurements _____ Field No. _____
 Owner J. F. Gambill Office No. 138
 Tenant _____ County San Patricio
 Location NE 1/4 Sec 4, Blk. R. Type of well drilled
 Measuring Point Top of well
 Height of Meas. Point above land surface datum 50 ft.

Date	Depth to water below meas. point	W. M. P. above L. S. on	Depth to water below L. S. on	Day	Remarks
11-14-50	10.13	0.8	9.33	21	Water pump on
11-21-51	9.56	0.8	8.76	16	Water pump on
2-8-53	8.57	0.8	7.77	24	Water pump on
11-3-54	9.51	0.8	8.71	85	Water pump on
12-5-55	8.85	0.8	8.05	15	Water pump on
11-4-56	10.72	0.8	9.92	30	Water pump on
11-1-57				15	Water pump on
11-1-59	6.74	0.8	5.94	15	Water pump on
2-29-60	8.31	0.8	7.51	15	Water pump on
3-19-61	7.94	0.8	7.14	15	Water pump on



TEXAS WATER DEVELOPMENT BOARD
WATER LEVEL OBSERVATION WELL REPORT

STATE WELL NUMBER: 8315202
PREVIOUS WELL NUMBER: 138
WELL LOCATION: LAT: 27 52 20
LONG: 097 10 13
WELL USE: H S

CURRENT DATE: Oct 5 1992
YEAR RECORD BEGINS: 1938
ELEVATION OF LAND SURFACE: 12
DEPTH OF WELL: 36

DATE OF CURRENT MEASUREMENT MO DAY YEAR	CURRENT DEPTH TO WATER FROM LAND SURFACE	CHANGE IN LEVEL SINCE LAST STATIC MEASUREMENT	MEASUREMENT NUMBER	ELEVATION OF WATER LEVEL	MEASURING AGENCY	MEASUREMENT METHOD	REMARKS
06/26/1938	-9.61		01	2	12		01
12/14/1939	-12.30	-2.69	01		12		01
03/18/1940	-11.59	0.71	01		12		01
08/08/1940	-9.86	1.73	01	2	12		01
11/16/1940	-8.82	1.04	01	3	12		01
02/27/1941	-8.08	0.74	01	4	12		01
05/17/1941	-7.50	0.58	01	5	12		01
05/31/1941	-7.66	-0.16	01	4	12		01
09/11/1941	-9.88	-2.22	01	2	12		01
01/21/1942	-11.27	-1.39	01	1	12		01
06/27/1942	-10.50	0.77	01	2	12		01
11/07/1945	-8.65	1.85	01	3	12		01
12/27/1945	-8.01	0.64	01	4	12		01
11/21/1947	-8.63	-0.62	01	3	12		01
11/16/1949	-5.39	3.24	01	7	12		01
11/14/1950	-9.33	-3.94	01	3	12		01
11/21/1951	-7.76	1.57	01	4	12		01
12/08/1953	-8.07	-0.31	01	4	12		01
12/13/1954	-8.71	-0.64	01	3	12		01
12/05/1955	-8.05	0.66	01	4	12		01
12/04/1956	-9.92	-1.87	01	2	12		01
11/19/1959	-5.94	3.98	01	6	12		01
09/29/1960	-7.51	-1.57	01	4	01	1	
03/19/1962	-7.14	0.37	01	5	01	1	
02/13/1963	-7.68	-0.54	01	4	01	1	
03/17/1964	-13.49	-5.81	01	1	01	1	

AQUIFER: GULF COAST AQUIFER
BASIN : San Antonio-Nueces Rivers
COUNTY : San Patricio

WELL CLASS AND NUMBER: HISTORICAL 8315202

APPENDIX C

INDUSTRIAL SOLID & HAZARDOUS WASTE

ISW -000031080-IN VOL: 001

INSPECTION REPORTS 1986 - /992

MEDIA CODE/FORMAT: F - MICROFICHE

BARCODE REFERENCE ID: 00002639

TEXAS WATER COMMISSION
Solid Waste Compliance Monitoring Inspection Report

TWC Reg. No. 3108

INSPECTION COVER SHEET

C.O. Use Only

02-86 LLS

EPA ID No. TXD 095102026 Commercial Waste Facility _____ Govt. Facility _____
NAME OF COMPANY ARM REFINING CO.
ADDRESS P.O. Box 546, INGLESIDE TX 78362 Tel. 512-776-2546
SITE LOCATION FM 2725 AND SUN RAY RD. INGLESIDE Tel. SAME
COUNTY SAN PATRICK TYPE OF INDUSTRY WASTE OIL RECLAIMER

Part A Application submitted to the State? Yes ☒ No _____ To EPA? Yes _____ No _____

Affidavit of Exclusion submitted to the State? Yes _____ No ☒

Written exclusion granted by TWC? Yes _____ No ☒ If yes, Date _____

Will this facility require a permit? Yes _____ No _____ ONLY IF THEY GENERATE SOLID WASTE WHEN AND IF THEY INITIATE REFINING ACTIVITIES.

Current Waste Management (Haz.-H, Class I NonHaz.-NH, Class II, III or check as appropriate):

Generator INH Treatment _____ Storage INH Disposal _____ Transporter _____

HW Exemptions: Sm Quan Gen. _____ 90-Day Storage _____ Other _____

HW Facilities (circle appropriate codes): C T SI WP LT LF I TT TR WDW O

NH Facilities (circle appropriate codes): C T SI ☒ LT LF I TT TR WDW O

Anomalies in the above information will be addressed by: (a) Enforcement in progress _____,

(b) Central Office _____, (c) District Office _____, (d) Owner/Operator _____.

Inspection Information:

Type of Inspection (circle): ☒ EV EB EC CL GW SA CD FO OT FE SW

Inspector's Name and Title WILLIAM BOWLES, ENGR. TECH V

Inspection Participants BERNIE DUNCAN, V.P.

Inspection Date(s) 12-5-85

Approved: Chap 108
District Manager

Signed: William F. Bowles
Inspector

Date: Jan. 14, 1986

TEXAS WATER COMMISSION
Solid Waste Compliance Monitoring Inspection Report

TWC Reg. No. 31080

CONTENTS SHEET

FACILITY NAME ARM REFINING CO.

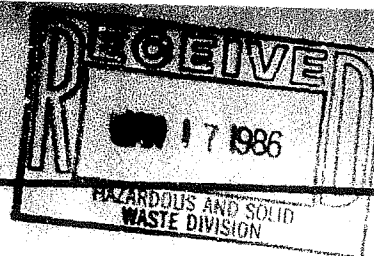
- ✓ 1. Code Sheet (0814)
- ✓ 2. Inspection Cover Sheet
- ✓ 3. Generators Checklist
- ✓ 4. General Facilities Checklist
5. Component Facility Checklists*
- _____ A. Containers (C)
- _____ B. Tanks (T)
- _____ C. Surface Impoundments (SI)
- ✓ 6. Waste Piles (WP)
- _____ E. Land Treatment (LT)
- _____ F. Landfills (LF)
- _____ G. Incinerators (I)
- _____ H. Thermal Treatment (TT)
- _____ I. Chemical, Physical, or Biological Treatment (TR)
- _____ J. Other (O) _____
- _____ 6. Closure and Post Closure Checklist
- _____ 7. Groundwater Monitoring Checklist
- ✓ 8. Notice of Violation (NOV) Letter
- ✓ 9. Interoffice Memorandum (IOM)
- ✓ 10. Registration
- _____ 11. Maps, Plans, Sketches
- _____ 12. Other (describe) _____

POOR QUALITY DOCUMENT

* If a required Checklist is omitted, explain: _____

Texas Water Commission

INTEROFFICE MEMORANDUM



TO : Bill Brown, Field Operations Liaison,
Hazardous and Solid Waste Division
THRU : Chip Volz, Manager, District 12

DATE: January 14, 1986

FROM : William F. Bowles, District 12

SUBJECT: Annual Solid Waste Compliance Inspection of
ARM Refining Company - Registration No. 31080

On December 5, 1985, I conducted an annual solid waste compliance inspection of the subject facility. This company does not operate as a refinery, which was their expected activity when they submitted their solid waste inventory. They are now in the waste oil reclamation business. Noncompliances noted during the inspection are Administrative Class II.

1. Notification of waste streams generated is not current. Violation of Texas Administrative Code (TAC) 335.6b.
2. Waste management methods in use do not agree with registration. Violation of TAC 335.6b.

A handwritten signature in dark ink, appearing to read "William F. Bowles", written over a horizontal line.

William F. Bowles

WFB/af

Attachments

POOR QUALITY DOCUMENT

ADVANCED RESOURCE MANAGEMENT, INC.

P. O. BOX 2083 - PHONE (512) 288-7474

CORPUS CHRISTI, TEXAS 78408

March 1, 1984

Industrial Solid Waste Section
Texas Department of Water Resources
P. O. Box 13087
Capitol Station
Austin, Texas 78711

Re: Copano Refining Company

Gentlemen:

On March 1, 1984, Advanced Resource Management, Inc. acquired the facility known as "Copano Refining Company" at Ingleside, Texas. The new name of the facility will be ARM Refining Company" with the same address and telephone number.

Enclosed is a revised Industrial Solid Waste Management Inventory form number TDWR-0060, in the name of "ARM Refining Company". Would you please change your records to reflect the name and ownership change?

The present solid waste registration numbers are listed as follows:

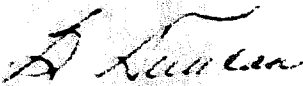
Texas - 31080

United States EPA - TXD095102026

Thank you for your assistance in this matter.

Sincerely

ADVANCED RESOURCE MANAGEMENT, INC.


Bernie Duncan
Vice President

BD/sd

Enclosures

cc: Mr. Paul Kutchinski
Texas Department of Water Resources District 12
505 South Water
Corpus Christi, Texas 78401

32090302021

ADDITIONAL COMMENTS

Item 1

ARM Refining Company initially began operation with the expectations of refining crude oil. This expectation failed to materialize. The company's operation now consists of reclaiming waste oil from drilling site pond skim and used lubrication oil from various sources. The company also uses their tank battery for temporary storage of product from other companies.

The waste streams generated consist of pond skim mud and debris sludge created during the separation stage of the recovery process. API separator sludge is listed only as IH when it is generated by the refining process. Subsequently, the Notice of Registration needs to reflect the company's actual status as a reclaimer and the waste streams generated by this activity. The oily mud generated is placed on the ground inside a tank containment area. No analysis of this material has been made.

Item 2

A follow-up inspection on December 11, 1985, that originated with a complaint, resulted in documenting an oil spill from an ARM pipeline which caused pollution to the surface waters of the State. The person in charge failed to notify the Texas Water Commission within the required 24 hours. This is a violation of the Texas Water Code Section 26.039. Investigation of this incident and clean-up is still in progress. Findings will be reported under separate cover.

TEXAS WATER COMMISSION

Paul Hopkins, Chairman
Ralph Roming, Commissioner
John O. Houchins, Commissioner



Larry R. Soward, Executive Director
Mary Ann Hefner, Chief Clerk
James K. Rourke, Jr., General Counsel

January 14, 1986

Mr. Bernie Duncan, Vice President
ARM Refining Company
P. O. Box 546
Ingleside, Texas 78362

Dear Mr. Duncan:

Re: Annual Solid Waste Compliance Inspection
ARM Refining Company - Registration No. 31080

On December 5, 1985, William Bowles of this office conducted an annual solid waste compliance inspection of your facility. A copy of the inspection report is attached. The following non-compliances were noted:

1. Notification of waste streams generated is not current. Violation of Texas Administrative Code (TAC) 335.6b.
2. Waste Management methods in use do not agree with registration. Violation of TAC 335.6b.

Please submit to this office in writing by February 14, 1986, your plans, including a timetable, that will insure compliance of your facility.

If you have any questions, please contact William F. Bowles at 512/882-2548 in Corpus Christi.

Yours truly,

Chip Volz
Chip Volz

District Manager

WFB/af

Attachments

REPLY TO: DISTRICT 12 / 505 SOUTH WATER STREET / CORPUS CHRISTI, TEXAS 78401 / AREA CODE 512/882-2548

P. O. Box 13087 Capitol Station • Austin, Texas 78711 • Area Code 512/463-7898

GENERATOR'S COMMENTS

TWC Reg. No. 31080

Section A - Notification and Waste Determination (335.6, .62, .63)

1. Has a determination has been made that all solid wastes generated are either hazardous or nonhazardous?

YES ☒ NO ☐

2. Check the method used for determination :

- a. Listed as a hazardous waste in 40 CFR Part 261, Subpart D. ☒
b. Process or materials knowledge. ☒
c. Tested for characteristics as identified in 40 CFR Part 261, Subpart C (If equivalent test method is used, attach a copy). ☐

NOTE: If a hazardous determination has not been made or appears to be incorrect, the inspector should obtain a sample of the waste for analysis and explain in comments.

3. Has the facility received an EPA ID number?

N/A ☐ YES ☒ NO ☐

4. Is notification of waste streams generated correct?

YES ☐ NO ☒

5. Do all waste management (TSD) methods in use agree with Registration?

YES ☐ NO ☒

6. Does this facility generate, treat, store, or dispose of **PCB** wastes? YES ☐ NO ☒
If yes, describe storage and disposition:

7. Does this facility generate **used oils** ?
If yes, describe storage and disposition:

YES ☐ NO ☒

8. Does this facility generate **spent solvents** ?
If yes, describe storage and disposition:

YES ☐ NO ☒

9. Does this facility utilize **slurries** in the management of hazardous waste? If yes, describe use:

YES ☐ NO ☒**POOR QUALITY DOCUMENT**

*** An entry in this column indicates corrective action/response is needed

Section B - Special Conditions (335.75)

1. If generator has received from or transported to a foreign entity any hazardous waste, has the appropriate notice been filed with the EPA Regional Administrator?
2. Was the waste manifested and signed by the foreign consignee?
3. Has confirmation of waste transport out of the country been received by the generator?

N/A ☒ YES ___ NO ___

N/A ☒ YES ___ NO ___

N/A ☒ YES ___ NO ___

Section C - Recordkeeping and Reporting (335.9, .10, .13, .70 - .72)

1. Does the generator maintain the following records and reports (if applicable) for the necessary three years?

- a. Shipping Manifests
- b. Monthly off-site shipment summaries
- c. Monthly on-site land disposal summaries
- d. Tests and analyses
- e. Annual reports

N/A ☒ YES ___ NO ___
N/A ☒ YES ___ NO ___
N/A ☒ YES ___ NO ___
N/A ___ YES ☒ NO ___
N/A ___ YES ☒ NO ___

2. Have any spills, unauthorized discharges or threats of such discharges occurred?

YES ___ NO ☒

If yes, have they been reported?(335.4, .453)

N/A ☒ YES ___ NO ___

Have they been remedied?(335.453) Explain.

N/A ___ YES ☒ NO ___

+++ DO NOT COMPLETE SECTION D IF GENERATOR DISPOSES OF WASTES ON-SITE ONLY+++

Section D - Pretransport and Manifest Requirements (335.61-68)

1. Identify primary off-site disposal facilities:

NA

POOR QUALITY DOCUMENT

2. Are off-site disposal facilities permitted or operating under interim status standards?

N/A ☒ YES ___ NO ___

3. Are TWC manifests properly completed?

N/A ☒ YES ___ NO ___

4. Has generator submitted exception reports to TWC for any original (white) copies of manifests not received?

N/A ☒ YES ___ NO ___

++++ STOP HERE IF FACILITY QUALIFIES AS A SMALL QUANTITY GENERATOR +++++

Section D - (Continued)

5. Do containers used to hold waste(s) meet DOT packaging requirements (49 CFR Parts 173, 178, 179) before being offered for transport (if circumstances observed)?
6. Does generator label and mark each package in accordance with 49 CFR Part 172 (if circumstances observed)?
7. Is each container of 110 gallons or less marked with the required hazardous waste warning label?
8. Does generator placard off-site waste shipments in accordance with DOT regulations (49 CFR Part 172, Subpart F)?

N/A ☒ YES ___ NO ___
N/A ☒ YES ___ NO ___
N/A ☒ YES ___ NO ___
N/A ☒ YES ___ NO ___

Section E - Accumulation Time Exemption (335.69)

Note: A facility may accumulate and store hazardous wastes in containers or tanks for up to 90 days without a permit.

1. Is each container used to temporarily store waste before transport clearly dated?
2. Are containers and/or tanks labeled as "Hazardous Waste" while accumulating waste on site?

N/A ☒ YES ___ NO ___
N/A ☒ YES ___ NO ___

Note: Attach a Container Storage Area Checklist for each container storage area.

Note: Attach a Tanks Checklist for each tank or each group of similar tanks.

Note: If this is a T/S/D Facility, proceed to General Facilities Checklist.

POOR QUALITY DOCUMENT

COMMENTS SHEET

Checklist GENERATORS

Section A / 4 & 5 - NOTIFICATION OF WASTE STREAMS AND
WASTE MANAGEMENT METHODS ARE NOT CORRECT. THIS
FACILITY IS NOT OPERATING AS A REFINERY AND THOSE
WASTE STREAMS THAT ARE LISTED DUE TO PROCESS SHOULD
BE CHANGED.

Section /

Section /

Section /

POOR QUALITY DOCUMENT

GENERAL FACILITIES CHECKLIST

TWC Reg. No. 31080

Section A - General Site Information

1. Are any solid waste facilities located in the 100-year floodplain? YES ☒ NO ☐
If yes, explain.
2. Describe land use within one mile RESIDENTIAL, INDUSTRIAL
3. Are there any closed or abandoned solid waste facilities? YES ☐ NO ☒
If yes, explain.
4. Has proof of deed recordation of all on-site solid waste disposal facilities been provided to the agency? N/A ☐ YES ☐ NO ☐
If no, explain.
5. Are all non-RCRA solid waste facilities compliant with the general prohibitions contained in TAC 335.4? N/A ☐ YES ☒ NO ☐
If no, explain.
6. An up-to-date Plant Map showing site orientation, waste management facilities, and major topographic features should be attached. Each facility checklist should have a Facility Map or Sketch attached.

+++ Note: For all non-RCRA facilities, do not complete the remainder of this General Facilities Checklist. Proceed to the individual facility checklists. +++

POOR QUALITY DOCUMENT

Section B - Personnel Training (335.117)

1. Owner/operator maintains proper personnel training records at the facility. N/A ☐ YES ☐ NO ☐
2. Personnel training records include:
 - a. Job title and written job description of each position. N/A ☐ YES ☐ NO ☐
 - b. Description of type and amount of training. N/A ☐ YES ☐ NO ☐
 - c. Records of training given to facility personnel. N/A ☐ YES ☐ NO ☐
3. Personnel training records are maintained for the appropriate length of time. N/A ☐ YES ☐ NO ☐
4. Training program is adequate for response to emergencies. N/A ☐ YES ☐ NO ☐

*** An entry in this column indicates corrective action/response is needed.

REGISTRATION NUMBER: 31000
COMPANY NAME: ARM REFINING COMPANY

000550

TEXAS DEPARTMENT OF WATER RESOURCES
NOTICE OF REGISTRATION
INDUSTRIAL SOLID WASTE GENERATION/DISPOSAL

00-27-

THIS IS NOT A PERMIT AND DOES NOT CONSTITUTE AUTHORIZATION OF ANY WASTE MANAGEMENT ACTIVITIES OR FACILITIES LISTED BELOW. REQUIREMENTS FOR SOLID WASTE MANAGEMENT ARE PROVIDED BY TEXAS ADMINISTRATIVE CODE SECTION 335 OF THE RULES OF THE TEXAS DEPARTMENT OF WATER RESOURCES (TDWR). CHANGES OR ADDITIONS TO WASTE MANAGEMENT METHODS REFERRED TO IN THIS NOTICE REQUIRE WRITTEN NOTIFICATION TO THE TDWR.

DATE OF NOTICE: 04-30-84

REGISTRATION DATE: 07-25-77

REGISTRATION NUMBER: 31000

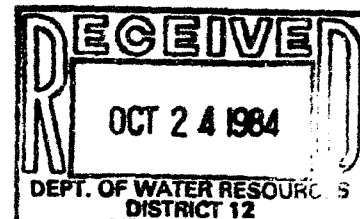
EPA I.D. NUMBER: TX0095102026

THE REGISTRATION NUMBER PROVIDES ACCESS TO STORED INFORMATION PERTAINING TO YOUR OPERATION. PLEASE REFER TO THAT NUMBER IN ANY CORRESPONDENCE.

COMPANY NAME: ARM REFINING COMPANY
MAILING ADDRESS: P. O. BOX 546
INGLESIDE, TEXAS

78362

GENERATING SITE LOCATION:
FM 2725 & SUN RAY RD, INGLESIDE
CONTACT PERSON: B. DUNCAN
PHONE: (512) 776-2546
NUMBER OF EMPLOYEES: 25 - 49
TDWR DISTRICT: 12



REGISTRATION STATUS: ACTIVE
HAZARDOUS WASTE STATUS: GENERATOR/TSD FACILITY
WASTE OIL RECLAIMER

POOR QUALITY DOCUMENT

I. WASTE GENERATED:

* LISTED FOR PETROLEUM REFINING INDUSTRY

WASTE NUMBER	DESCRIPTION	CLASS CODE	DISPOSITION
-----------------	-------------	------------	-------------

001	DISSOLVED AIR FLOTATION FLOAT	IN 952100	ON-SITE/OFF-SITE
-----	-------------------------------	-----------	------------------

EPA HAZARDOUS WASTE NOS. (REFER TO 40 CFR PART 261 FOR DESCRIPTIONS): K048

NOT GENERATED AT THIS TIME

002	SLOP OIL EMULSION SOLIDS	IN 951570	ON-SITE/OFF-SITE
-----	--------------------------	-----------	------------------

EPA HAZARDOUS WASTE NOS. (REFER TO 40 CFR PART 261 FOR DESCRIPTIONS): K049

003	HEAT EXCHANGER BUNDLE CLEANING SLUDGE	IN 941350	ON-SITE/OFF-SITE
-----	--	-----------	------------------

NOT GENERATED

NOTICE OF REGISTRATION (CONTINUED)
REGISTRATION NUMBER: 31002
COMPANY NAME: ARM REFINING COMPANY

PAGE 2

EPA HAZARDOUS WASTE NOS. (REFER TO 40 CFR PART 261 FOR DESCRIPTIONS): NOS0

*004 API SEPARATOR SLUDGE IN 950050 ON-SITE/OFF-SITE ✓

EPA HAZARDOUS WASTE NOS. (REFER TO 40 CFR PART 261 FOR DESCRIPTIONS): NOS1

005 TANK BOTTOMS WITH LEAD IN 950220 ON-SITE/OFF-SITE

EPA HAZARDOUS WASTE NOS. (REFER TO 40 CFR PART 261 FOR DESCRIPTIONS): NOS2
NOT GENERATED

006 TANK BOTTOMS IN 152180 ON-SITE/SECONDARY USE ✓
E

II. SHIPPING/REPORTING: PURSUANT TO TEXAS ADMINISTRATIVE CODE SECTION 335 OF THE RULES OF THE TOWR PERTAINING TO INDUSTRIAL SOLID WASTE MANAGEMENT, ISSUANCE OF SHIPPING-CONTROL TICKETS AND MONTHLY REPORTING ARE REQUIRED FOR OFF-SITE STORAGE/PROCESSING/DISPOSAL OF THE FOLLOWING CLASS I WASTES LISTED IN PART I. A SHIPMENT SUMMARY REPORT SHOULD BE SUBMITTED FOR EACH MONTH NOT LATER THAN THE 25TH OF THE FOLLOWING MONTH.

001 952100 DISSOLVED AIR FLOTATION FLOAT NONE

*002 951570 SLOP OIL EMULSION SOLIDS ✓

003 941350 HEAT EXCHANGER BUNDLE CLEANING NONE
SLUDGE

*004 950050 API SEPARATOR SLUDGE ✓

005 950220 TANK BOTTOMS WITH LEAD NONE POOR QUALITY DOCUMENT

III. ON-SITE WASTE MANAGEMENT FACILITIES:

FAC NO.	FACILITY	STATUS
01	TANK STORAGE OF WASTE NUMBER(S) 001 NO!	ACTIVE
02	TANK STORAGE OF WASTE NUMBER(S) 002 USED IN RECLAMATION	ACTIVE
03	BULK STORAGE AREA WASTE PILE of OILY DIRT INSIDE STORAGE TANK CONTAINMENT AREA OF WASTE NUMBER(S) 003, 004, 005 002	ACTIVE ✓

NOTICE OF REGISTRATION (CONTINUED)
REGISTRATION NUMBER: 31080
COMPANY NAME: ARM REFINING COMPANY

PAGE

3

00 TANK
STORAGE
OF WASTE NUMBER(S) 006

ACTIVE

UNLESS OTHERWISE STATED ABOVE, FACILITIES ARE LOCATED
AT FM 2725 & SUN RAY RD, INGLESIDE
COUNTY OF SAN PATRICK

IV. RECORDS.

- A. FOR PURPOSES OF FILING ANNUAL REPORTS PURSUANT TO TEXAS
ADMINISTRATIVE CODE SECTION 335 OF THE RULES OF THE TDWR
PERTAINING TO INDUSTRIAL SOLID WASTE MANAGEMENT, RECORDS
SHOULD BE MAINTAINED FOR STORAGE, PROCESSING AND/OR DISPOSAL
OF THE FOLLOWING WASTE(S) LISTED IN PART I:

001 952100 DISSOLVED AIR FLOTATION FLOAT
002 951570 SLOP OIL EMULSION SOLIDS
003 941350 HEAT EXCHANGER BUNDLE CLEANING
SLUDGE
004 950350 API SEPARATOR SLUDGE
005 950220 TANK BOTTOMS WITH LEAD
006 152180 TANK BOTTOMS

POOR QUALITY DOCUMENT

TEXAS WATER COMMISSION
Solid Waste Inspection Report

TWC Reg. No. 31680

TWC District 12

INSPECTION COVER SHEET

C.O. Use Only

1490 / 177

EPA ID No. TXD95102826

COMMERCIAL WASTE FACILITY

NAME OF COMPANY ARM Refining Company

MAILING ADDRESS P.O. Box 546 Longview, TX 78362

Tel. 512/ 884-3991

SITE LOCATION FM 2725 ; Sun Ray Rd.

Tel. _____

COUNTY San Patricio TYPE OF INDUSTRY oil reclamation / originally petroleum refining

GENERATOR CLASSIFICATION: Industrial ☒ Municipal _____

GOVT. FACILITY: _____

OPERATIONAL STATUS: INACTIVE

Part A Permit Application submitted to the State? Yes ☒ No _____
Affidavit of Exclusion submitted to TWC? Yes ☒ No ☒ Can't know nothing in file
Was a written exclusion granted by TWC? N/A Yes _____ No ☒ If yes, Date: _____
Will this facility require a RCRA permit? Yes _____ No ☒
Part-B application submitted? N/A Yes _____ No ☒
RCRA closure required? N/A Yes _____ No ☒

CURRENT WASTE MANAGEMENT (Haz. - "H"; Class I NonHaz. - "NH"; Class II - "II"; Class III - "III")

Generator _____ Treatment _____ Storage ^{*} _____ Disposal _____ Transporter _____
Classification PENDING WASTE DETERMINATION

HW EXEMPTIONS: ☐ CESQG: Total HW Generation per Month: <100 kg. HW & <1 kg. Acute HW
☐ SQG: Total HW Generation per Month: 100 to 1000 kg. HW & <1 kg. Acute HW
☐ 90-Day Accumulation
☐ OTHER: _____

H W FACILITIES (circle codes): SA C T SI WP LT LF I TT TR WDW O

N H FACILITIES (circle codes): C T SI WP LT LF I TT TR WDW O

ENFORCEMENT STATUS: NOV 5/87

TYPE OF INSPECTION (circle): CKI SA CL CD OT FO FEE BILL REC REV

Inspector's Name and Title CARLTON H. STANLEY

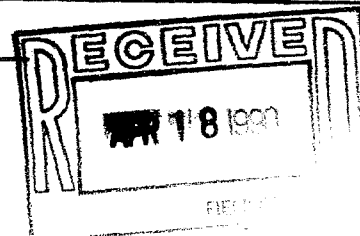
Inspection Participants BERNIE DUNCAN

Date(s) of Inspection MARCH 28, 1990

Signed: Carlton H. Stanley 4-16-90
Inspector Date

Approved: Chip Voz
District Manager

POOR QUALITY DOCUMENT



TEXAS WATER COMMISSION

B. J. Wynne, III, Chairman
John E. Birdwell, Commissioner
Cliff Johnson, Commissioner



John J. Vay, General Counsel
Michael E. Field, Chief Hearings Examiner
Brenda W. Foster, Chief Clerk

Allen Beinke, Executive Director

April 16, 1990

Mr. Bernie Duncan
ARM Refining Company
118 Markham
Portland, Texas 78374

Re: ARM Refining Company
Solid Waste Registration No. 31080
Notice of Solid Waste Violations

Dear Mr. Duncan:

On March 27, 1990, Carlton Stanley of the Texas Water Commission (TWC) District 12 office conducted an inspection of the above referenced facility to determine compliance with the Commission's rules pertaining to solid waste management. During the inspection, conditions were observed and documented that we believe constitute noncompliance with the solid waste rules. The following areas of alleged noncompliance were observed:

1. Failure to make a hazardous waste determination on 19 drums of unknown materials. Violation of TAC 335.62.
2. Failure to update Notice of Registration to indicate the current status of the facility. Violation of TAC 335.6(a)(b).

Concerning these alleged noncompliances, we request your response in writing with a schedule for corrective action(s) by May 16, 1990. We also request that you advise us of any corrective action which you have taken.

An on-site inspection or review of records will be conducted at the appropriate time to verify compliance. You are advised that failure to respond within the requested time frame and adequately remedy solid waste noncompliances may result in the initiation of formal enforcement action which could lead to administrative penalties of up to \$10,000 per day assessed against the company by the Texas Water Commission.

REPLY TO: DISTRICT 12 / 4410 DILLON LANE, SUITE 47 / CORPUS CHRISTI, TEXAS 78415-5326 / AREA CODE 512/851-8484

P. O. Box 13087 Capitol Station • 1700 North Congress Ave. • Austin, Texas 78711-3087 • Area Code 512/463-7830

Mr. Duncan
April 16, 1990
Page 2

A copy of the Texas Administrative Code (TAC) regulations can be obtained for a fee from Agency Information Consultants, Inc., P. O. Box 2181, Austin, Texas 78768; telephone number 512/478-8991. The Code of Federal Regulations (40 CFR Parts 190-399) are available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

If you have any questions regarding these matters, please contact Buddy Stanley of the TWC District 12 office at 512/851-8484.

Sincerely,

Carlton Stanley
Chip ^{for} Holz
District Manager

CHS/sbp

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Texas Water Commission

INTEROFFICE MEMORANDUM

TO : Files

DATE: April 16, 1990

THRU : Ernest W. Heyer, Head, Program Services Unit,
Field Operations Division

FROM : Carlton H. Stanley, District 12

SUBJECT: ARM Refining Company
Solid Waste Registration No. 31080

TEXAS WATER COMMISSION
RECEIVED

FIELD OPERATIONS DIV.
CENTRAL OFFICE, AUSTIN

On March 27, 1990 I conducted a solid waste fee bill inspection at the ARM Refining site. Bernie Duncan, former owner, was contacted and accompanied me on the inspection.

ARM purchased this refinery in March 1984 with the expectations of taking various waste hydrocarbons and refining them into petroleum products with API product specifications.

This endeavor never materialized. The company, when last doing business, was operating under an R2 Permit from the Texas Railroad Commission. Only waste generated during this time (eg. BS&W) was under RRC jurisdiction. Also, the tank farm was leased to other companies to terminal crude and other products.

According to Duncan, ARM went out of business in 1987. In 1989, a firm called Great Western Petroleum purchased the refinery to make jet fuel. Great Western made some cosmetic improvements, but did not make any payments on the facility. Great Western was recently evicted from the facility.

The North Carolina National Bank currently holds the note on the facility. According to Duncan they have no immediate plans to foreclose on the note. Duncan said that a Houston Company is interested in buying the facility. Duncan requested that the name of the potential buyer be held in confidence.

Additionally, when Great Western was in possession of the refinery they leased a portion of the property adjoining FM 2725 to Sonny Kathey. Kathey is still on the premises and is operating under a Railroad Commission R2 Permit.

Some minor housekeeping problems were noted near the API separator and there were some small amounts of tank bottoms inside some of the fire walls.

ARM Refining Company
April 16, 1990
Page 2

Also there were 19 drums containing oily material and others of unknown content at the facility. Duncan did not know what these materials were, when they were generated, or if all of them were waste.

The following violations were noted:

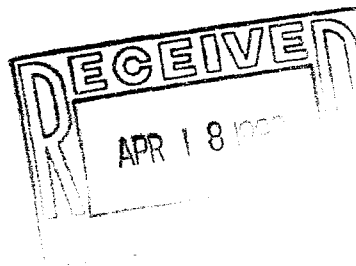
1. Failure to make a hazardous waste determination on the 19 drums with unknown contents. Violation of TAC 335.62.
2. Failure to update NOR to indicate the current status of the facility. Violation of 335.6(a)(b).

Pending hazardous waste determination, the company could have other violations.


Buddy Stanley

BS/sp

Attachments





May 06, 1997

To: TEXAS NATURAL RESOURCE CONSERVATION COMMISSION
Bernard Nelson, Leader / Annie Morales, Initial Processed
Data Control Team
Waste Evaluation Section
Industrial & Hazardous Waste Division
Mail Code: MC 129
P.O. Box 13087
Austin, Texas 78711-3087

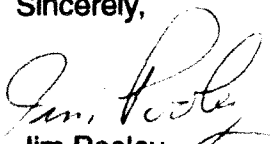
From: PLX Ingleside Inc.
Jim Pooley, Terminal Manager 968
1269 Sunray Road
Ingleside, Texas 78362
Ph: (512) 776-3104
Fax: (512) 776-3952

Subject: PLX Notice of Registration (NOR) Corrections

T.N.R.C.C., Waste Evaluation Section:

PLX Ingleside Inc. received the updated NOR on April 28, 1997, from the T.N.R.C.C. Upon review, several entry corrections are apparent on pages 1 and 2 of 4 spreadsheets. Please make these corrections with your Data Control Team of the Waste Evaluation Section.

Sincerely,


Jim Pooley
Terminal Manager

w/attachments

cc: Troy E. Valenzuela, PLX Compliance Coordinator
Pete Geurin, Plains Terminal & Transfer

1269 SUNRAY ROAD • INGLESIDE, TEXAS 78362

■ 512/776-3104 ■ Fax 512/776-3952

More to be
copied
if needed

2857
DC AM

Barry R. McBee, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
John M. Baker, *Commissioner*
Dan Pearson, *Executive Director*



TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

April 24, 1997

Dear Generator:

Enclosed is a copy of your new or updated Notice of Registration (NOR). The Data Control team processes registrations and updates in the order that the information is received. If you have submitted several requests for changes or updates they may or may not be reflected on this NOR.

It is the policy of the Waste Evaluation Section to request that you submit all new waste codes and units on the appropriate form. New waste codes and units may also be submitted via STEERS. You may discuss modifying the forms with the Data Control Team. Any administrative changes, i.e., company name changes, contact person, waste management practices, additional EPA codes, etc., must be submitted by letter.

Please take the time now to review your new NOR carefully, checking for oversights or discrepancies. If there are multiple incorrect entries on your NOR, we urge you to call and, if necessary, make an appointment with the Data Control Team so these problems can be handled expeditiously. This initial registration or update was processed by Annie Morales.

We look forward to your comments and working with you to insure that your NOR accurately reflect your hazardous or industrial waste management activities. Please be sure to include our mail code in the mailing address: MC129. If you need additional information, assistance, or copies of the forms, please contact the Waste Evaluation Section at (512) 239-6832.

Sincerely,

Annie Morales

for Bennard Nelson, Leader
Data Control Team
Waste Evaluation Section
Industrial and Hazardous Waste Division

BN/AM/abx

Enclosure

*** TEXAS NATURAL RESOURCE CONSERVATION COMMISSION ***
Notice of Registration
Industrial and Hazardous WastePage: 1
Date: 04/23/97

This registration does not constitute authorization of any waste management activities or facilities listed below. The registration reflects hazardous and/or industrial waste generation and management activities for which the registrant has provided notification. Requirements for solid waste management are provided by Texas Administrative code section 335 of the rules of the Texas Natural Resource Conservation Commission (TNRCC). Changes or additions to waste management methods referred to in this notice require written notification to the TNRCC.

Solid Waste Registration Number: 31080 EPA Id: TXD095102026

The Solid Waste Registration Number provides access to computerized and filed information pertaining to your operation. Please refer to that number in any correspondence.

Company Name: ~~PLX Industries, Inc.~~ **PLX Ingleside Inc.**
Site Name: ~~PLX Industries, Inc.~~ **PLX Ingleside Inc.**
Site Location: FM 2725 at Sunray Road, Ingleside, TX 78362
Contact: Pooley, Jim

Region: 14 Initial Registration Date: 07/25/1977
County: 205 SAN PATRICIO Last Amendment Date: 02/24/1997
Title: Last Date NOR Computer update: 03/18/1997
Phone: 512-776-3104

Mailing Address: 1269 Sunray Road
Ingleside, TX 78362-

Site Street Address: ~~FM 2725 Sunray Road~~ **1269 Sunray Road**
Ingleside, TX 78362

Registration Status: Active
Registration Type: Generator
Generator Type: Industrial

Hazardous Waste Generation Status: Conditionally Exempt Small Quantity Generator

Business Description: Oil terminal

Primary SIC Code: **5171 Petroleum and Petroleum Product Bulk Station and Terminals**
Handler Status: 1311 Crude Petroleum And Natural Gas

Operator Information

Name:
Phone:
Address:

Owner Information

Name: Enjet Refining, Inc. **PLX INGLESIDE INC**
Phone: **512-776-3104**
Address: ~~P.O. Box 1631~~ **1269 Sunray Road**
Ingleside, TX, 78362-

As of 02/24/1997 - the next unassigned sequence number for WASTES is 1759 and
the next unassigned sequence number for UNITS is 005.

Section 335, Chapter 31 of the Texas Administrative Code specifies the notification, record keeping, manifesting and reporting requirements for hazardous and industrial solid wastes.

*** TEXAS NATURAL RESOURCE CONSERVATION COMMISSION ***
 Notice of Registration
 Industrial and Hazardous Waste

Page: 2
 Date: 04/23/97

31080 PLX Industries, Inc

**** WASTE INFORMATION ****

Texas Waste Code	Waste Class	Status	Date of Status	Managed Onsite/Offsite	Radio-active	TNRCC Audit Complete
***** Active Wastes *****						

0501203H H Active 08/12/94 Off No No
 Description from Generator: Waste solvent from cleaning and degreasing of various parts before reassembly. Waste generated 1994.

Form Code: 203 Non-halogenated solvent
 EPA Hazardous Waste Numbers: D001 D006 D007 D018 D039 D040

Current Management Units: None

- * Origin Codes: 1 Onsite-process/service
- * Source Codes: A19 Other cleaning and degreasing
- * Measurement Points: 1 Before mixing
- * SIC Codes: 1311 Crude Petroleum And Natural Gas

5171 Petroleum and Petroleum Product Bulk Storage and Terminals

17584091 1 Active 08/12/94 Off No No
 Description from Generator: Waste sorbent material from clean up of minor spills. Waste generated 1994.

Form Code: 409 Other non-halogenated organic solids

Current Management Units: None

- * Origin Codes: 1 Onsite-process/service

* The first value is considered the primary value (e.g. primary origin code).
 As of 02/24/1997, the next unassigned sequence number for WASTES is 1759.

** No Longer Generated Wastes **

152180 1 Inactive 12/16/94 NA No
 Description from Generator: TANK BOTTOMS

Form Code:

Current Management Units: None

- * Origin Codes:

941350 H Inactive 12/16/94 NA No
 Description from Generator: HEAT EXCHANGER BUNDLE CLEANING SLUDGE

Form Code:

EPA Hazardous Waste Numbers: K050

Current Management Units: None

- * Origin Codes:

*** TEXAS NATURAL RESOURCE CONSERVATION COMMISSION ***
Notice of Registration
Industrial and Hazardous WastePage: 3
Date: 04/23/97

31080 PLA Industries, Inc.

Texas Waste Code	Waste Class	Status	Date of Status	Managed Onsite/Offsite	Radio-active	TNRCC Audit Complete
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** No Longer Generated Wastes **

950050 H Inactive 12/16/94 NA No

Description from Generator: API SEPARATOR SLUDGE

Form Code:

EPA Hazardous Waste Numbers: K051

Current Management Units: None

* Origin Codes:

950220 H Inactive 12/16/94 NA No

Description from Generator: TANK BOTTOMS WITH LEAD

Form Code:

EPA Hazardous Waste Numbers: K052

Current Management Units: None

* Origin Codes:

951570 H Inactive 12/16/94 NA No

Description from Generator: SLOP OIL EMULSION SOLIDS

Form Code:

EPA Hazardous Waste Numbers: K049

Current Management Units: None

* Origin Codes:

952100 H Inactive 12/16/94 NA No

Description from Generator: DAF FLOAT

Form Code:

EPA Hazardous Waste Numbers: K040

Current Management Units: None

* Origin Codes:

* The first value is considered the primary value (e.g. primary origin code).

As of 02/24/1997, the next unassigned sequence number for WASTES is 1759.

Refer to 40 CFR Part 261 for Descriptions of EPA Hazardous Waste Numbers.

IHW020

*** TEXAS NATURAL RESOURCE CONSERVATION COMMISSION ***
Notice of Registration
Industrial and Hazardous WastePage: 4
Date: 04/23/97

31080 PLX Industries, Inc.

**** UNITS AT THIS SITE MANAGING WASTE ****

Unit Number	Unit Type	Unit Status	Date of Status	Classes of Waste Managed in Unit Onsite / Offsite	Unit Permit Number	Unit # on Permit	Regulatory Status	Deed Recording Needed/Date
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** 'Active' & 'Closure Pending' Units **

001	Waste Pile	Active	03/01/84	NA	NA	NA	Non-Hazardous Regulated	NA /
-----	------------	--------	----------	----	----	----	-------------------------	------

Description from Company: Contaminated soil waste pile. Located adjacent to API separator evacuation.
Waste pile is lined and covered with impermeable plastic. Capacity:
approximately 200 yd.3

System Types: 141 Storage

Biennial System Regulatory Status: Regulatory status unknown

Wastes Currently Managed in Unit:

Wastes Previously Managed in Unit: 952100

002	Tank	Active	03/01/84	/ NA	NA	NA		NA /
-----	------	--------	----------	------	----	----	--	------

System Types:

Wastes Currently Managed in Unit:

Wastes Previously Managed in Unit: 951570

003	Waste Pile	Active	03/01/84	/ NA	NA	NA		NA /
-----	------------	--------	----------	------	----	----	--	------

System Types:

Wastes Currently Managed in Unit:

Wastes Previously Managed in Unit: 941350 950050 950220

004	Tank	Active	03/01/84	/ NA	NA	NA		NA /
-----	------	--------	----------	------	----	----	--	------

System Types:

Wastes Currently Managed in Unit:

Wastes Previously Managed in Unit: 152180

As of 02/24/1997, the next unassigned sequence number for UNITS is 005.

31080

Per page



February 21, 1997

To: Texas Natural Resources Conservation Commission
Industrial and Hazardous Waste Division
Waste Evaluation Section-MC 129
P.O. Box 13087
Austin, Texas 78711-3087

From: PLX Ingleside Inc.
1269 Sunray Road
Ingleside, Texas 78362

Subject: PLX Ingleside Inc. 1996 Annual Waste Summary For T.N.R.C.C.

To Whom It May Concern:

Attached is the PLX Ingleside Inc. 1996 Annual Waste Summary. Please, also note that your Annual Waste Summary packet for the report year 1996 was not received here at PLX Ingleside Inc. until after your due date for return, which was January 25, 1997.

Your packet was mailed to the previous owner of this facility, Enjet Refining, Inc. at its old post office box, which is no longer active. Several "Change of Ownership" notices were sent to T.N.R.C.C., as my records indicate.

RE: Change of Ownership for : Enjet Refining, Inc.
1269 Sunray Road
Ingleside, Texas 78362
Permit No. 6536A,
Account No. SD0035R

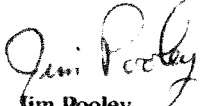
2446
DCAM

A change of ownership did occur in February, 1996. The new owner and operator is:

PLX Ingleside Inc.
1269 Sunray Road
Ingleside, Texas 78362
Federal Tax I.D. No. 76-0493777

Thank you for your assistance in updating this change of ownership notice.

Sincerely,


Jim Pooley
Terminal Manager

cc: Pete Geurin, Plains Terminal & Transfer

Troy E. Valenzuela, Stocker Resources

ENTRIX

31080

ENTRIX, Inc.

2000 West 10th Street

Austin, TX 78704

713-440-0200

713-440-1144

December 10, 1996

Data Control Team

Waste Evaluation Section, I & HW

Texas Natural Resource Conservation Commission

P.O. Box 13087

Austin, Texas 78711-3087

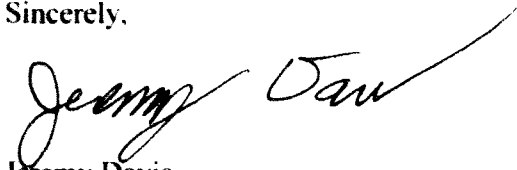
U.S. MAIL

Re: Facility Change of Ownership
Solid Waste Registration No. 31087

31080

This letter is submitted on behalf of PLX Ingleside, Inc. by ENTRIX, Inc. to inform you that the registered facility under Solid Waste Registration No. ~~31087~~ has changed ownership. The facility name is currently listed as Enjet, Inc. and should now be listed as "PLX Ingleside, Inc." Please make the necessary corrections to the Notice of Registration (NOR).

Sincerely,



Jeremy Davis
Staff Engineer

cc: Pete Geurin, Plains Terminal and Transfer
Troy Valenzuela, Stocker Resources

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LLLL

Handwritten notes: 11/13/97

document3



TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

ONE-TIME SHIPMENT REQUEST FOR TEXAS WASTE CODE FOR SHIPMENT OF CLASS 1, 2, 3 AND EPA HAZARDOUS WASTE

Pursuant to the generator notification requirements of 30 TAC Section 335.6, the generator of a solid waste is required to submit to the TNRCC detailed written information pertaining to the composition and characteristics of the waste.

Please type or print legibly:

Mr. Pete Geurin
PLX Ingleside, Inc.
Route 1, Box 595
Cushing, Oklahoma 74023

GENERATOR CONTACT PERSON
GENERATOR COMPANY NAME
GENERATOR MAILING ADDRESS
CITY, STATE, ZIP CODE
PHONE NO. (918) 225-6717

(LEAVE BLANK IF NOT REGISTERED)

31090

Solid Waste Registration No.

TXD095102026

U. S. EPA Identification No.

*Are you CESQG? ☐ Yes ☐ No

Are you industrial? ☒ Yes ☐ No

If industrial, have you submitted TNRCC

Initial Notification packet? ☒ Yes ☐ No

Date submitted: _____

Generating Site Location (☐ Check if same as above) FM 2725 at Sunray Road, Ingleside, Texas

(STREET ADDRESS OR PHYSICAL DESCRIPTION)

Designated Treatment, Storage, and/or Disposal Facility Name and Address Texas Ecologists, Robstown Landfill
County Road 44, Robstown, TX

DESCRIPTION OF WASTE
(do not use DOT description or trade name)

1. Oily sludge

2. _____

3. _____

4. _____

GENERATOR/REPRESENTATIVE

I certify that the above information is correct to the best of my knowledge.

I, Jeremy Davis, am employed by

(NAME, Please Print)

ENTRIX, Inc.

(COMPANY NAME)

5252 Westchester, Suite 250, Hou., TX 77005

(MAILING ADDRESS)

and am authorized to sign this certification for:

PLX Ingleside, Inc.

(COMPANY NAME)

Jeremy Davis
(SIGNATURE)

8/21/96

(DATE)

TNRCC USE ONLY

For TNRCC Assignment of
Texas Waste Code Number

DGB5603H

TEXAS WASTE CODES

FORM CODE	CLASS CODE	EPA CODE	ORIGIN CODE
603	H	0018	7

PROCESSED DATE: 8-30-96

PROCESSED BY: jd

TNRCC REGION: 014

OFFICE

Mail to:

TNRCC

I & HW, Waste Evaluation Section
Waste Report Audit Team, MC 129
P.O. Box 13087

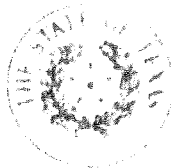
Austin, Texas 78711-3087

Phone: (512) 239-6832 FAX: (512) 239-6410

(713) 666-6223

(PHONE NUMBER)

Barry R. McBee, Chairman
R. B. "Ralph" Marquez, Commissioner
John M. Baker, Commissioner
Dan Pearson, Executive Director



TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

April 3, 1996

CERTIFIED MAIL

P 053 915 627

Mr. Mark Shires
President
Plains Terminal and Transfer
Route 1, Box
Cushing, Oklahoma 74023

Re: PLX Ingleside, Inc.
EPA ID No. TXD095102026
TNRCC Solid Waste Registration No. 31080
Site Inspection

Dear Mr. Shires:

On March 8 and 11, 1996, Ms. Karen Dodson of the Texas Natural Resource Conservation Commission (TNRCC) Region 14 office conducted an inspection of the above-named facility. The inspection was conducted to determine the facility's compliance with applicable laws, regulations, and permit provisions pertaining to industrial solid waste management. The inspector observed and documented conditions that we believe constitute violations of these requirements, as is explained in this letter and the attached summary.

The Commission recognizes that the great majority of the regulated community wants to prevent pollution and to comply with environmental laws. The agency looks forward to working with you to resolve this matter. We ask that you respond in writing with your proposed schedule for corrective actions, and that you do so no later than 30 calendar days from the date of receipt of this letter. We also ask that you advise us of any corrective action which you have already taken. Please be aware that you must be in compliance within 135 days of the date of the inspection.

We will conduct an on-site inspection or review of records at the appropriate time to verify compliance. If PLX Ingleside, Inc. responds within the specified time frame, completes any requested corrective action, and corrects the violations cited in the attached summary, we will not pursue further action for the violations at this time. However, please note that the Legislature has granted the Commission enforcement powers to carry out its mission to protect human health and the

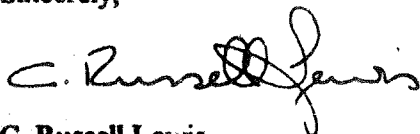
Mr. Mark Shires
SW# 31080
April 3, 1996
Page 2

environment. If you fail to adequately respond we will ask the Commission to exercise those powers

We have attached to this letter a summary of alleged violations, citing the applicable Commission rules. Official copies of the Commission rules can be obtained from the Texas Register, P.O. Box 13824, Austin TX 78711-3824, telephone number 512/463-5561 or from West Publishing Company, P.O. Box 64526, St. Paul MN 55164-0526, telephone number 612/687-7000. The applicable federal regulations are found in the Code of Federal Regulations, 40 CFR Parts 260-299. The federal regulations may be obtained from the U.S. Government Printing Office, Texas Crude Building, 801 Travis Street, Houston TX 77002, telephone number 713/228-1187 or from the U.S. Government Printing Office, Room 1C-50, Federal Building, 1100 Commerce Street, Dallas, TX 75242, telephone number 214/767-0076.

If you have any questions regarding these matters, please contact Karen Dodson at (512)851-8484.

Sincerely,



C. Russell Lewis
Waste Program Manager

KKD/amw

Attachments

Mr. Mark Shires
SW# 31080
April 3, 1996
Page 2

SUMMARY OF ALLEGED VIOLATIONS
Plains Terminal and Transfer
CEI CONDUCTED 3/8-11/1996

1. 30 TAC Chapters 335.62, 335.9 (a)(1)(A), and 335.513
40 CFR 262.11 - Hazardous Waste Determination

The applicable portion of the regulation states that any person who generates a solid waste, must determine if that waste is a hazardous waste, and shall keep records of the description, character, and classification of the waste.

PLX Ingleside, Inc. failed to make a hazardous waste determination prior to removal of the contents in the two API separators.

2. 30 TAC Chapter 335.4/Chapter 26.121 Texas Water Code - General Prohibitions

Prohibits the discharge or imminent threat of discharge of industrial solid waste into or adjacent to waters in the state.

Visible hydrocarbon contamination was evident in the excavated stockpiled soil. The excavation contained groundwater.

EPA ID# TXD095102026

Commercial Waste Facility

(ck)

Name of company: PLX Ingleside, Inc.Mailing Address: P.O. Box 1631Site Address: 1269 Sunray Road, FM 2725 at Sunray RoadCounty: San Patricio Type of Industry: bulk storagePrevious name(s) of company (if applicable): Enjet Refining, Inc.Property owner (if different than company): N/AGENERATOR CLASSIFICATION: Industrial X Municipal FACILITY CLASSIFICATION: Government Non-Gov't. XOPERATIONAL STATUS: Active

Current Waste Management:

(Please note the class of waste(s)
for each activity listed.)

H = Hazardous

1 = Class 1 Non-hazardous

2 = Class 2 Non-haz.

3 = Class 3 Non-haz.

Generator Treatment Storage Disposal Transporter

Pending Notification

and Waste Determination H.1.2.3HAZARDOUS WASTE EXEMPTIONS: CE-SQG

(circle >)

SQG

< 90 DAY ACCUMULATION

OTHER*

* (Elementary Neutralization, WW Treatment Tanks, < 0 Day
Treatment, etc.)

H W FACILITIES (circle codes): SA C T SI WP LT LF I TT TR WDW

N H FACILITIES (circle codes): C T SI WP LT LF I TT TR WDW

TYPE OF INSPECTION (circle) CEI NRR CSE SPL CDI CME OAM

OTH (+ reason)

04 = complaint

06 = closure

22 = SPL results

34 = UIC

40 = BIF

46 = DOD

53 = multi-media

61 = state fee billInspector's Name and Title Karen Dodson - Environmental InvestigatorInspection Participants Mark Shires, Drannon Geurin, Bryan WesterdahlDate(s) of Inspection 03/08/96

(begin)

03/11/96

(end)

Signed: [Signature]

(date)

Approved: [Signature]

(date)

Texas Natural Resource Conservation Commission

INTEROFFICE MEMORANDUM

To: FILES Date: April 3, 1996

Thru: Ernest Heyer
Field Operations Division

From: Karen Dodson, Region 14
Corpus Christi Office

Subject: PLX Ingleside, Inc., (PLX) ISW REG. # 31080,
EPA ID # TXD095102026, Permit # NONE
State Inspection, Conducted March 8 and 11, 1996

INTRODUCTION

On March 8 and 11, 1996 I conducted an inspection at the subject facility. During the inspection, I was accompanied by Mark Shires President of Plains Terminal & Transfer, Drannon Geurin Terminal Manager with Plains Terminal & Transfer, and Bryan Westerdahl Operations Supervisor with PLX Ingleside, Inc. The terminal and transfer facility is located at the intersection of FM 2725 and Sunray Road in San Patricio County. The dock is located at North Bank Terminal on the Intracoastal Waterway near mile marker 537. Surrounding land use includes industrial and residential.

GENERAL FACILITY AND WASTE PROCESS INFORMATION

PLX Ingleside, Inc. acquired the property February 16, 1996 and operates a bulk petroleum product storage and transfer facility. Transfer of petroleum products occurs via trucks and barges. Previous operations under different ownership include a 10,000 barrel per day hydrocarbon topping unit capable of naphtha, kerosene, diesel, and residual oil production. The refinery equipment including two API separators remain onsite. During the inspection, API separator II contained what appeared to be ground water that was recharging to the separator via a hole. Soil adjacent to the separator had been excavated and stockpiled. The soil had a hydrocarbon odor. API separator I contained oily sludge. Also, several monitor wells exist onsite. No information on these monitor wells was available during the inspection.

BACKGROUND

File review revealed the facility has had several owners including:

- 1977 - Tipperary Refining Company ?
- 1978 - Raymal Refining, Limited
- 1980 - Copano Refining Company
- 1984 - Advanced Resource Management, Inc.
- 1989 - Great Western Petroleum
- 1990 - Red's Refinery, Inc.
- 1990 - Enjet Refining, Inc.
- 1996 - PLX Ingleside, Inc.

ADDITIONAL INFORMATION

List of Attachments:

- I: Notice of Registration
- II: Facility Maps
- III: Tank Inventory on March 7, 1996
- IV: Sample Results
- V: Photographs

SUMMARY OF ALLEGED VIOLATIONS

1. 30 TAC Chapters 335.62, 335.9(a)(1)(A), and 335.513
40 CFR 262.11 - Hazardous Waste Determination

The applicable portion of the regulation states that any person who generates a solid waste, must determine if that waste is a hazardous waste, and shall keep records of the description, character, and classification of each waste.

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Prohibits the discharge or imminent threat of discharge of industrial solid waste into or adjacent to waters in the state.

Visible hydrocarbon contamination was evident in the excavated stockpiled soil. The excavation contained ground water.

ION
SWR # 31080
Page -3-

Signed 
Karen Dodson - Environmental Investigator

Approved 
Russell Lewis - Waste Program Manager

**Attachment I:
Notice of Registration**

TX00018

*** TEXAS NATURAL RESOURCE CONSERVATION COMMISSION ***
Notice of Registration
Industrial and Hazardous Waste

Page: 1
Date: 03/08/96

31080 Enjet Refining Inc

Solid Waste Registration Number: 31080 EPA Id: TXD095102026

Company Name: Enjet Refining Inc
Site Name: Enjet Refining, Inc.
Site Location: FM 2725 at Sunray Road, Ingleside, TX 78362
Contact: Westerdahl, Bryan

Region: 14 Initial Registration Date: 07/25/1977
County: 205 SAN PATRICIO Last Amendment Date: 08/12/1994
Title: Terminal Manager Last Date NOR Computer update: 02/08/1996
Phone: 512/776-3104

Mailing Address: P.O. Box 1631
Aransas Pass, TX 78336

Site Street Address:
Ingleside, TX 78362

Registration Status: Active HW Permit #:
Registration Type: Generator
Generator Type: Industrial

Hazardous Waste Generation Status: Conditionally Exempt Small Quantity Generator

Business Description: Oil terminal

Primary SIC Code: 1311 Crude Petroleum And Natural Gas
Handler Status:

Operator Information

Name:

Address:

Owner Information

Name: Enjet Refining, Inc.

Address: P.O. Box 1631
Ingleside, TX, 78362

As of 08/12/1994 the next unassigned sequence number for WASTES is 1784 and
the next unassigned sequence number for UNITS is 605

*** TEXAS NATURAL RESOURCE CONSERVATION COMMISSION ***
 Notice of Registration
 Industrial and Hazardous Waste

Page: 2
 Date: 01/08/96

31000 Enjet Refining Inc

**** WASTE INFORMATION ****

Texas Waste Code	Waste Class	Status	Date of Status	Managed Onsite/Offsite	Radio-active	TNRCC Audit Complete
------------------	-------------	--------	----------------	------------------------	--------------	----------------------

***** Active Wastes *****

0501203H H Active 08/12/94 Off No No
 Description from Generator: Waste solvent from cleaning and degreasing of various parts before reassembly. Waste generated 1994.

Form Code: 203 Non-halogenated solvent

EPA Hazardous Waste Numbers: D001 D006 D007 D018 D039 D040

Current Management Units: None

* Origin Codes: 1 Onsite-process/service

* Source Codes: A19 Other cleaning and degreasing

* Measurement Points: 1 Before mixing

* SIC Codes: 1311 Crude Petroleum And Natural Gas

17584091 1 Active 08/12/94 Off No No
 Description from Generator: Waste sorbent material from clean up of minor spills. Waste generated 1994.

Form Code: 409 Other non-halogenated organic solids

Current Management Units: None

* Origin Codes: 1 Onsite-process/service

* The first value is considered the primary value (e.g. primary origin code).
 As of 08/12/1994, the next unassigned sequence number for WASTES is 1759.

** No Longer Generated Wastes **

152180 1 Inactive 12-16/94 NA No

Description from Generator: TANK BOTTOMS

Form Code:

Current Management Units: None

* Origin Codes:

941150 H Inactive 12-16/94 NA No

Description from Generator: HEAT EXCHANGER BUNDLE CLEANING SLUDGE

Form Code:

EPA Hazardous Waste Numbers: K050

Current Management Units: None

* Origin Codes:

950050 H Inactive 12-16/94 NA No

Description from Generator: API SEPARATOR SLUDGE

Form Code:

EPA Hazardous Waste Numbers: K051

Current Management Units: None

* Origin Codes:

Office of Registration
 Industrial and Hazardous Waste

Date: 03/08/96

31080 Majet Refining Inc

Texas Waste Code	Waste Class	Status	Date of Status	Managed Onsite/Offsite	Radio-active	TNRCC Audit Complete
** No Longer Generated Wastes **						

950270 H Inactive 12/16/94 NA No

Description from Generator: TANK BOTTOMS WITH LEAD

Form Code:

EPA Hazardous Waste Numbers: K052

Current Management Units: None

* Origin Codes:

951576 H Inactive 12/16/94 NA No

Description from Generator: SLOP OIL EMULSION SOLIDS

Form Code:

EPA Hazardous Waste Numbers: K049

Current Management Units: None

* Origin Codes:

952100 H Inactive 12/16/94 NA No

Description from Generator: DAF FLOAT

Form Code:

EPA Hazardous Waste Numbers: K048

Current Management Units: None

* Origin Codes:

* The first value is considered the primary value (e.g. primary origin code).

As of 08/12/1994, the next unassigned sequence number for WASTES is 1759.

*** TEXAS NATURAL RESOURCE CONSERVATION COMMISSION ***
 Notice of Registration
 Industrial and Hazardous Waste

Page: 4
 Date: 03/08/96

11000 Enjet Refining Inc

**** UNITS AT THIS SITE MANAGING WASTE ****

Unit Number	Unit Type	Unit Status	Date of Status	Classes of Waste Managed in Unit Onsite / Offsite	Unit Permit Number	Unit # on Permit	Regulatory Status	Deed Recording Needed/Date
** 'Active' & 'Closure Pending' Units **								
001	Tank	Active	03/01/84	NA	NA	NA		NA
System Types:								
Wastes Currently Managed in Unit:								
Wastes Previously Managed in Unit: 952100								
002	Tank	Active	03/01/84	NA	NA	NA		NA
System Types:								
Wastes Currently Managed in Unit:								
Wastes Previously Managed in Unit: 951570								
003	Waste Pile	Active	03/01/84	NA	NA	NA		NA
System Types:								
Wastes Currently Managed in Unit:								
Wastes Previously Managed in Unit: 941150 950050 950220								
004	Tank	Active	03/01/84	NA	NA	NA		NA
System Types:								
Wastes Currently Managed in Unit:								
Wastes Previously Managed in Unit: 152180								

As of 08/12/1994, the next unassigned sequence number for UNITS is 005.

Report Name : V0401_0001_001/001_report
Report Program : V0401_0001_001/001_report
Date : 08-Mar-1996 11:53:14
User ID : kddoon

Selection Criteria

SW Regis. No : 11040

Sort Criteria: Registration Number

**Attachment II:
Facility Maps**

Attachment III:
Tank Inventory on March 7, 1996

PLX INGLESIDE INC.
TANK INVENTORY

G-07

DATE 03/07/96

FR/MWS

		CUSTOMER/							
TANK #	GAUGE	PRODUCT	GROSS BBL	TEMP.	API	FACTOR	NET BBL	INITIALS	
T-100	9' 10 1/2"	ENJET/HPO	12,979.63	121.3	0.5	0.9788	12,704.46	FR	
T-101	0' 41/2"	PLAINS/NAPHTHA	492.52	60.0	60.2	1.0000	492.52	MWS	
T-102	0' 0"	PLAINS/NAPHTHA	0.00	0.0	70.1	0.0000	0.00	MWS	
T-120	0' 0"	PLAINS/BLENSTK		0.0	78.1	0.0000	0.00	MWS	
T-121	0' 5 7/8"	PLAINS/CUTTER	306.83	60.0	15.1	1.0000	306.83	MWS	
T-131	8' 9"	ENJET/MDO	5,426.94	59.3	27.5	1.0002	5,428.03	MWS	
T-132	10' 5 7/8"	ENJET/NAPHTHA	6,506.63	62.2	67.2	0.9986	6,497.52	MWS	
T-133	0' 7 1/2"	ENJET/NAPHTHA	391.33	60.0	67.2	1.0000	391.33	MWS	
T-140	22' 11"	ENJET/CUTTER	14,380.97	60.1	15.2	1.0000	14,380.97	MWS	
T-150	28' 3 3/4"	ENJET/HPO	14,496.83	147.3	0.7	0.9698	14,059.03	FR	
T-151	7' 3 3/4"	ENJET/#6 OIL	9,417.00	152.6	12.3	0.9642	9,079.87	MWS	
T-040	1' 6"	RECOVERED OIL	136.68	62.5	12.10	0.9990			
T-10	20' 0"	RECOVERED OIL	3,331.56	51.2	13.40	1.0035			

**Attachment IV:
Sample Results**

REV. 05/10
Site Name 1717 Intersection, Texas
Site Location FM 2725 @ S.W. Road

Point of Collection API #1

County San Antonio Basin San Antonio-Nueces

Method of Collection Tap w/100

Type facility: ☐ Drum; ☐ Tank; ☐ Impoundment; ☐ Landfill
☐ Waste pile; ☐ Landfarm; ☐ Other

Time Collected 1410 (am/pm) Date Shipped 5/1/10

Add. COC # N/A

ODOR: ☒ Yes; ☐ No; Describe Hydrocarbon

S.W. Registration										Permit Number										Page No.										Date																																							
1										9 10										18 19 21 22										Mo. Day Y.																																							
31080										N/A										B031196																																																	
30 Code										35 Parameter Value										44 Code										49 Parameter Value										58 Code										63 Parameter Value										71									

(Collector's Signature)

TEXAS WATER COMMISSION TWC 0849 (Rev. 05-23-86)

NO. SW 189728

Dist. 14 Org. No. 4214 Work No. 92890 Lab CODE

Material Sampled: ☐ Solid waste (W); ☒ Liquid waste (L); ☐ Soil (E); ☐ Well (M);
☐ Stream (S); ☐ Other (O)

Comments API #1

Lab Only	Date	rec'd	(Lab No)
	Date	cmplt	
Analyst sign.			

Preservation: ☐ None; ☐ Ice; ☐ H₂SO₄; ☐ HNO₃
Other

Auxiliary Tags LEACHATE ☐ EP Toxicity Series: ☐ TWC

30 Code										35 Parameter Value										44 Code										49 Parameter Value										58 Code										63 Parameter Value										71									
pH																				VOLATILES																				TOTAL CHROMIUM																													
00403																																																																					
COD																				SEMI-VOLATILES																				TOTAL CHROMIUM																													
00340																																																																					
TOC																				PCBS																				TOTAL LEAD																													
00680																																																																					
GROSS																				TOX																				TCLP MERCURY																													
																				TOTAL ARSENIC																																																	

RECEIVED

MAY 29 1996

FIELD OPERATIONS
REGION 14

NO. SW 105120
 Site Name PLX Insurance, Inc.
 Site Location FM 2725A Sunday Road
Indus. A
 County San Antonio Basin San Antonio-Nueces Comm.
 Method of Collection Dip w/ 1002

Point of Collection Tank 10
 Type facility: ☐ Drum; ☒ Tank; ☐ Impoundment; ☐ Landfill
☐ Waste pile; ☐ Landfarm; ☐ Other _____
 Time Collected 1400 (am/pm) Date Shipped 03/11/96
 Add. COC #s 10/12
 ODOR: ☒ Yes; ☐ No; Describe Hydrocarbon Bunk

S.W. Registration										Permit Number										Page No.										Date																																							
1										9 10										19 19 21										22 23 24 25 26 27 28 29																																							
3 1 0 3 0										N/A 0 0 1										B 0 3 1 1 9 6																																																	
30 Code										35 Parameter Value										44 Code										49 Parameter Value										58 Code										63 Parameter Value										71									

[Signature]
 (Collector's Signature)

TEXAS WATER COMMISSION TWC-0849 (Rev 05 23 86)

NO. SW 189726
Basin H Org. No. 4214 Work No. 97532 Lab CORE
 Material Sampled: ☐ Solid waste (W); ☒ Liquid waste (L); ☐ Soil (E); ☐ Well (M);
☐ Stream (S); ☐ Other (O) _____
 Comments TANK 10

Lab Only	Date	rec'd:	(Lab No.)
		cmpt.	
	Analyst sign:		

Preservation: ☐ None; ☐ Ice; ☐ H₂SO₄; ☐ HNO₃
 Other _____

Auxiliary Tags LEACHATE: ☐ EP Toxicity Series; ☐ TWC

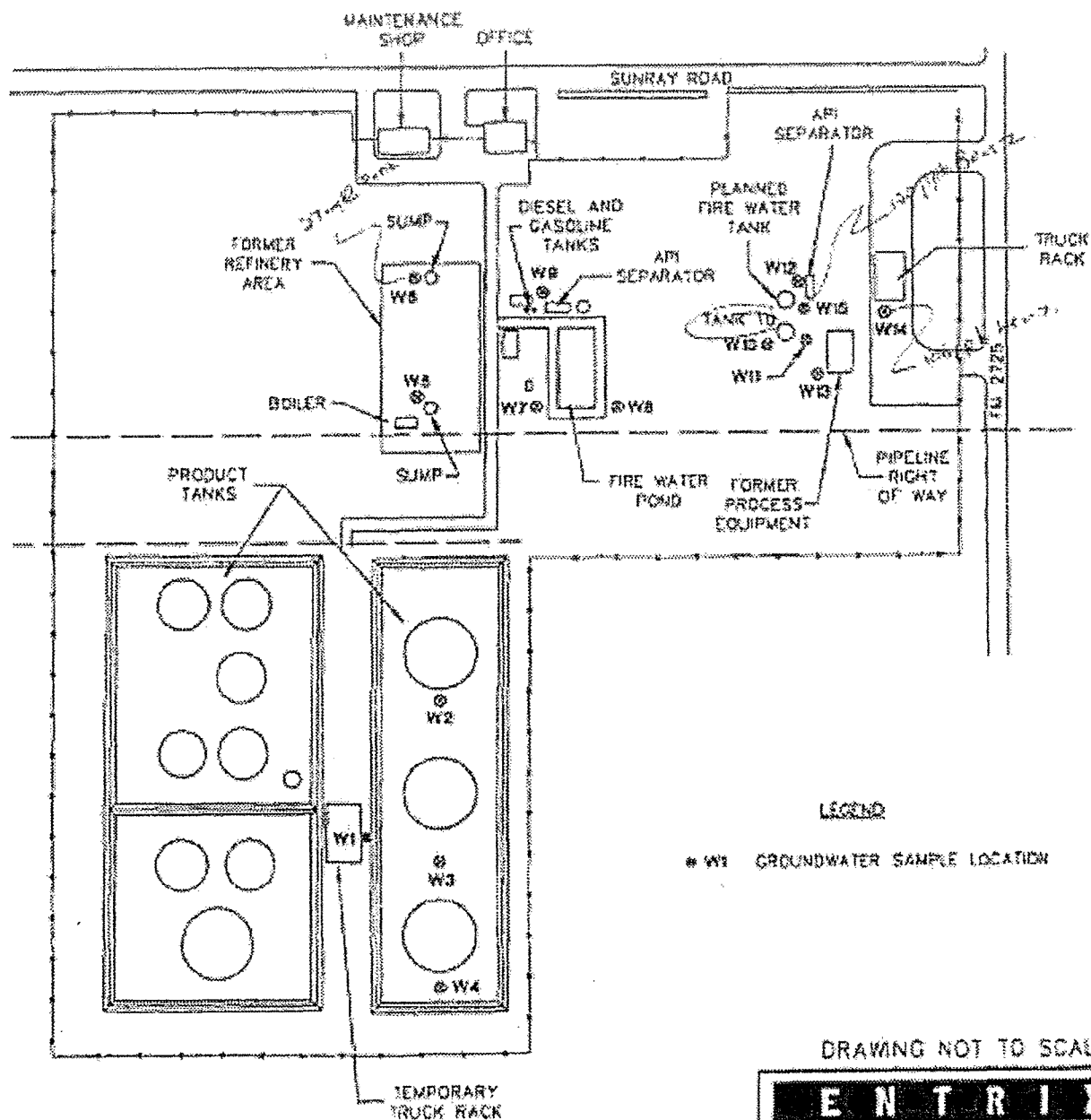
30 Code										35 Parameter Value										44 Code										49 Parameter Value										58 Code										63 Parameter Value										71									
0 0 4 0 3																				VOLATILES																				TOTAL CADMIUM																													
0 0 3 4 0																				SEMI-VOLATILES																				TOTAL CADMIUM																													
0 0 6 8 0																				PCB's																				TOTAL LEAD																													
																				TOX																				TRIP Mercury																													
																				Total Arsenic																																																	

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 NES 21
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 10/10/96

71607 105

APPENDIX D

2/24/25 10:07 "O R ACAD\330412\FIC-2



LEGEND

* W1 GROUNDWATER SAMPLE LOCATION

DRAWING NOT TO SCALE

ENTRIX

Figure 1
Site Layout
Enjet Refining Facility
Ingleside, Texas

PROJ. NO. 100412 | SHEET | DATE: 11/23

TABLE 3
Summary of Laboratory Analyses
Groundwater Samples
Enjet Refinery Facility, Ingleside, TX
ENTRIX Project No. 130417

Location	benzene (ppm)	ethylbenzene (ppm)	toluene (ppm)	xylene (ppm)	TPH-D (ppm)
W-1	ND***	11.5	2.7	10.3	41
W-2	ND*** < 2 ppm	10.0	3.1	11.7	106
W-3	ND*	ND*	ND*	ND*	2.1
W-4	ND	ND	ND	ND	ND
W-5	0.0074	0.0086	0.0059	0.0215	ND
W-6	27.3	18.6	17.2	65.6	144
W-7	ND	ND	ND	ND	ND
W-8	ND*	ND*	ND*	ND*	2.1
W-9	0.0059	0.0038	0.0022	0.0061	ND
W-10	ND	ND	ND	ND	ND
W-11	0.0024	0.0049	0.0046	0.0175	38
W-12	ND**	0.140	ND**	ND**	107
W-13	ND	0.0021	ND	ND	ND
W-14	0.106	0.097	0.077	0.272	12.6
W-15	0.120	0.077	0.081	0.517	11.2
MRL†	0.001	0.001	0.001	0.003	0.2

† Method Reporting Level

* Detection limit raised to 2 times the MRL

** Detection limit raised to 100 times the MRL

*** Detection limit raised to 2000 times the MRL

APPENDIX E

RECEIVED

DEC 21 2005

VOLUNTARY CLEANUP SECTION

**THIRD QUARTER 2005
GROUNDWATER MONITORING REPORT
PLAINS MARKETING TERMINAL
INGLESIDE, TEXAS
VCP NO. 449**

Prepared for

PLAINS MARKETING, L.P.
Ingleside, Texas

Prepared by

Quest Consulting, Inc.
6700 West Loop South, Suite 310
Bellaire, Texas
(713) 667-6323

Project No. 02401

October 2005

TABLE OF CONTENTS

1.0	Introduction	1-1
1.1	Site Description.....	1-1
1.2	API Separator Release Discovery.....	1-1
1.3	Chronology of Activities Performed in the VCP	1-1
1.3.1	Quest Consulting, Inc.'s Project Involvement	1-3
1.4	Delineation of Groundwater Affected by the API Separator Release	1-3
2.0	Third Quarter 2005 Groundwater Monitoring Event.....	2-1
2.1	Current Groundwater Monitoring Program	2-1
2.2	Groundwater Monitoring Activities.....	2-1
2.3	Groundwater Flow	2-2
2.4	Analytical Results	2-2
3.0	Summary	3-1

Tables

Table 1 - Groundwater Elevation Data

Table 2 - Groundwater Analytical Results

Table 3 - Historical Groundwater Sampling Results

Figures

Figure 1 – Site Plan

Figure 2 – Potentiometric Surface Diagram

Figure 3 – Monitor Well COC Diagram

Appendices

- A Laboratory Analytical Data Sheets and Chain of Custody Documentation
— September 2005 Sampling Event

1.0 INTRODUCTION

1.1 Site Description

The Plains Marketing (PM) Ingleside Terminal is located at 2725 Sunray Road in Ingleside, Texas (the site). A site plan is presented on Figure 1. The Ingleside facility operates as a petroleum products terminal and currently operates 11 tanks for storage of refined petroleum products, including naphtha, distillates, marine diesel oil, no. 6 fuel oil, gasoline blendstocks, alkylate products, and other refined materials. The facility receives product by tanker truck. Products are loaded out primarily through a leased barge dock, located approximately one mile east of the facility on an inlet connected to the Intracoastal Waterway. The facility is approximately 26 acres in size and is located in a rural residential area, with some oilfield-related business in the vicinity. The closest surface water body is Redfish Bay, located approximately $\frac{3}{4}$ of a mile to the east of the facility.

1.2 API Separator Release Discovery & Voluntary Cleanup Program Application

In October 1996, PM removed two in-ground API separators under a workplan that was submitted to the TCEQ Region 14 office. (Prior to 1999, the Ingleside facility was referred to as PLX-Ingleside; the name was changed to Plains Marketing, and notification of the name change was made in a letter to the TNRCC dated March 9, 1999.) Upon removal of the separators, it was determined that shallow groundwater, as well as surrounding saturated and unsaturated soils, had been affected by a release of hydrocarbons, and an application was submitted to the Texas Commission on Environmental Quality's (TCEQ, formerly the Texas Natural Resource Conservation Committee) Voluntary Cleanup Program (VCP) in January 1997.

The site was accepted into the TCEQ's VCP in March 1997, and was assigned VCP No. 449. In subsequent discussions with the VCP Project Manager, PLX outlined a Partial Response Action Area (PRAA) for the Ingleside site. The PRAA comprises approximately 5.5 acres of the 26 acre site.

1.3 Chronology of Activities Performed in the VCP

A work plan for quarterly groundwater monitoring activities was provided to the VCP Project Manager in a letter dated April 19, 1999. The work plan established selected site wells, both inside and outside of the PRAA, to be included in the groundwater monitoring program. The groundwater monitoring program is discussed in more detail in Section 1.3, below.

Activities performed at the site in response to the release from the API separators since 1999 include the following:

- January 28, 1999 letter to PM from VCP. The VCP Project Manager requests that a quarterly groundwater monitoring program be established at the site.
- April 1999. PM submits a work plan providing details of the proposed program.
- June 10, 1999 letter from VCP to PM. The proposed groundwater monitoring program is approved by the VCP. Groundwater samples will be collected from selected monitoring wells, both inside and outside of the PRAA as follows: MW-4, MW-6, MW-7, MW-8, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, and MW-17.
- August 10, 1999. The initial quarterly sampling event takes place and is referred to as the third quarter 1999 event.
- November 2000 Quarterly Monitoring Report. In response to the declining levels of constituents in the wells, PM requests that several monitoring wells be deleted from the quarterly monitoring program.
- January 30, 2001 letter from VCP to PM. The VCP project manager agrees to delete MW-7, MW-13, MW-15, and MW-16 from the quarterly monitoring program; these wells will continue to be sampled yearly. Two wells, MW-6 and MW-10, are permanently removed from the groundwater monitoring program. Quarterly monitoring will be performed for eight wells: MW-4, MW-8, MW-11, MW-12, MW-14, MW-17, MW-18 and MW-19.
- May 10, 2002 letter from PM to the VCP. PM formally requests that closure for soil and groundwater impacts at the Ingleside facility be determined under the Texas Risk Reduction Program (TRRP).
- June 26, 2002 letter from VCP to PM. The VCP Project Manager accepts this approach and requests additional information regarding previous soil sampling at the site.
- August 14, 2002 letter from PM to the VCP. PM provided the soil sampling information and parts of an Affected Property Assessment Report (APAR) to the VCP. The APAR information submitted summarized the evaluation and selection of critical Protective Concentration Limits (PCLs) for soil and groundwater at the site. The VCP Project Manager agrees with findings, provided that further soil sampling is conducted in the area near the former API separator.
- Third Quarter 2002. PM collects soil samples in conjunction with the third quarter 2002 groundwater monitoring event. Sampling results indicate some constituents of concern (COCs) in soil above the applicable PCLs remain.
- January and March of 2003. PM excavates and disposes the affected soils in this area.

- August 2003. PM submits the second quarter 2003 groundwater monitoring results and documentation of the soil removal activities. PM requests closure from the VCP.
- October 13, 2003 letter from VCP to PM. The VCP Project Manager responds in noting that COC concentrations in groundwater have exhibited a minor increase in the second quarter 2003 period and that continued evaluation of the groundwater plume will be necessary before granting closure.
- Third Quarter 2003 to Present. PM conducts additional quarterly groundwater monitoring, to verify that the plume is stable and declining.
- December 3, 2004 letter from VCP to PM. New VCP Project Manager (Stuart Goldsmith) concurs with the proposal contained in the 3Q04 Quarterly Groundwater Monitoring Report to continue the groundwater monitoring program at the site and requests that future quarterly groundwater monitoring reports include a map showing concentrations of the chemicals of concern in groundwater for each well.

1.3.1 Quest Consulting Inc.'s Project Involvement

Beginning with the Fourth Quarter 1999 groundwater monitoring event, Quest Consulting, Inc. (Quest) was retained by PM to perform the quarterly and annual groundwater sampling activities agreed upon with the VCP for the site and to prepare monitoring reports to document these activities.

1.4 Delineation Groundwater Affected by the API Separator Release

Based on groundwater sampling results from the current and historical monitoring programs at the site, benzene is the only constituent of concern that has been detected in groundwater at concentrations exceeding its PCL. The extent of groundwater exceeding the PCLs is bounded within the current configuration of monitoring wells.

2.0 THIRD QUARTER 2005 GROUNDWATER MONITORING EVENT

2.1 Current Groundwater Monitoring Program

The objective of the site groundwater monitoring program is to provide data over time regarding the nature and extent of the dissolved-phase hydrocarbon plume in the shallow water-bearing zone from the API Separator release. This information will be used to support the future proposed closure of the VCP site under the TCEQ's TRRP Rule.

The groundwater monitoring program at the site currently consists of the following:

- Measurement of groundwater elevations in monitor wells MW-4 through MW-19 and development of a potentiometric diagram based on those elevations.
- Quarterly sampling of groundwater from the following selected monitor wells at the site: MW-4, MW-8, MW-11, MW-12, MW-14, MW-17, MW-18 and MW-19.
- Annual sampling of groundwater from monitoring wells MW-7, MW-13, MW-15, and MW-16, during the third quarter monitoring event.
- Analysis of the groundwater samples for BTEX/MTBE and TPH (TX 1005).
- Preparation of a quarterly groundwater monitoring report, providing methodology and analytical laboratory results.

2.2 Groundwater Monitoring Activities

The third Quarter 2005 groundwater monitoring event was performed on September 12, 2005. Prior to sampling activities, water level elevations were measured in 16 groundwater monitor wells, using a water level indicator. Groundwater sampling was conducted after measurement of water levels, and samples were collected using a low-flow submersible pump. Groundwater samples were collected from each of the eight wells specified for quarterly monitoring and from the four wells specified for annual sampling.

The wells were purged using a low-flow method, with a peristaltic pump and dedicated polyethylene tubing. The inlet of the tubing was positioned approximately at the midpoint of the well screen interval. With the tube intake at the appropriate depth, groundwater was removed at the recommended purge rate of 0.1 to 0.5 liters per minute. A Miron L (water quality meter) was utilized during well purging to monitor the pH, temperature, dissolved oxygen, and specific conductivity. At least 0.5 liters of water was purged from each well between measurements of the above parameters. Purging was considered complete when the parameters stabilized over three consecutive readings. After purging was completed, the groundwater sample was then collected directly into

laboratory-provided sample containers. The sample containers were placed on ice in a cooler.

At the end of the sampling event, the samples were transported to e-Lab, Inc. in Houston, Texas for analysis. The samples were analyzed for BTEX/MTBE (EPA Method 8021) and TPH (TX 1005).

2.3 Groundwater Flow

Table 1 presents the groundwater elevations measured on September 12, 2005. Based on the groundwater elevations measured in the available network of monitoring wells within or near the PRAA, a potentiometric surface diagram of the shallow water-bearing zone was prepared (see Figure 2). The diagram shows groundwater flow primarily to the east-northeast for the majority of the site. This is consistent with the flow direction determined from previous groundwater elevation measurements.

2.4 Analytical Results

Groundwater analytical results for the September 12, 2005 groundwater monitoring event are presented in Table 2. A comparison of the results to results from previous sampling events is presented in Table 3. Figure 3 is a diagram showing concentrations of the chemicals of concern in groundwater for each well.

During the September 2005 monitoring event, COCs were detected in groundwater samples collected from 6 of the 12 monitoring wells sampled. Of these six wells, only the sample from MW-11 contained a COC, benzene, in excess of the applicable PCL. Benzene was detected in the groundwater sample collected from this well at a concentration of 120 mg/L, which is a slightly lower concentration than that detected during the previous sampling event. COCs were also detected in the groundwater samples collected from monitoring wells MW-17, 18 and MW-19. However, none of these samples contained COCs at concentrations exceeding the applicable PCLs. The September 2005 monitoring event represents the second consecutive quarterly event in which COCs were found in the groundwater samples collected from MW-18 and MW-19.

3.0 SUMMARY

Quest has performed the third quarter 2005 groundwater sampling event for PM, collecting samples from the 12 monitor wells included in the annual monitoring program. The groundwater samples were analyzed for BTEX/MTBE and TPH, the primary COCs from the API separator release (located within the PRAA).

The results of the September 2005 sampling event are as follows:

- Benzene was detected in groundwater samples collected from MW-11, MW-12, and MW-14. The groundwater sample from MW-11 was the only one containing benzene at a concentration in excess of the PCL.
- COCs were detected in groundwater samples collected from monitoring wells MW-18 and MW-19 (which are located east of FM 2725) at concentrations less than the PCLs. This represents the second consecutive quarter in which COCs have been detected in groundwater samples from the most downgradient wells at the site.

Table 1
Groundwater Elevation Data
Plains Marketing - Ingleside Facility

		September 12, 2005	
Well	TOC	DTW	Elev
MW-4	21.00	2.99	18.01
MW-5	20.95	2.77	18.18
MW-6	19.59	3.16	16.43
MW-7	17.27	2.17	15.10
MW-8	17.25	5.23	12.02
MW-9	17.60	2.85	14.75
MW-10	17.81	2.64	15.17
MW-11	18.43	4.86	13.57
MW-12	18.41	3.27	15.14
MW-13	18.81	4.07	14.74
MW-14	13.41	1.83	11.58
MW-15	17.43	5.33	12.10
MW-16	17.86	5.87	11.99
MW-17	16.45	4.89	11.56
MW-18	11.49	4.66	6.83
MW-19	13.65	1.65	12.00

Notes:

TOC = top of casing elevation

DTW = depth to water (feet)

Elev = groundwater elevation

Table 2

Groundwater Analytical Results
Third Quarter 2005 Sampling Event (September 12, 2005)
Plains Marketing - Ingleside Facility

Sample Location	Method 8021					TPH TX 1005		
	ug/L					mg/L		
	benzene	toluene	ethylbenzene	xylene	MTBE	C ₆ -C ₁₂	C ₁₂ -C ₂₈	C ₂₈ -C ₃₅
MW-4	<0.10	<0.10	<0.10	<0.20	<0.35	<0.20	<0.20	<0.20
MW-7	<0.10	1.6	<0.10	<0.20	1.5 J	<0.20	<0.20	<0.20
MW-8	<0.10	<0.10	<0.10	<0.20	<0.35	<0.20	<0.20	<0.20
MW-11	120	3.8	280	43	<0.35	5	4.6	<0.2
MW-12	0.71 J	<0.10	0.74 J	<0.20	6.1	<0.20	<0.20	<0.20
MW-13	<0.10	<0.10	<0.10	<0.20	2.8 J	<0.20	<0.20	<0.20
MW-14	4.7	1.6	12	<0.20	1.8 J	<0.20	<0.20	<0.20
MW-15	<0.10	<0.10	<0.10	<0.20	<0.35	<0.20	<0.20	<0.20
MW-16	<0.10	<0.10	<0.10	<0.20	<0.35	<0.20	<0.20	<0.20
MW-17	<0.10	1.5	14	0.59 J	<0.35	<0.20	<0.20	<0.20
MW-18	<0.10	<0.10	<0.10	<0.20	9.3	<0.20	<0.20	<0.20
MW-19	<0.10	1.3	<0.10	<0.20	<0.35	<0.20	<0.20	<0.20

Notes:

ND Not detected
 ug/L Micrograms per liter
 mg/L Milligrams per liter
 NA Not Analyzed
 J Estimated value

Table 3

Historical Groundwater Sampling Results
Plains Marketing - Ingleside Facility

Monitor Well	date	Method 8020 or 8021					Method 8015 or TX 1005**
		ug/l					mg/l
		benzene	toluene	ethylbenzene	xylenes	MTBE	TPH
Tier 1 Residential PCL		5	1,000	700	10,000	240	-
MW-4	Sep-05	<0.10	<0.10	<0.10	<0.20	<0.35	<0.20
	May-05	<0.10	<0.10	<0.10	<0.20	<0.35	1.39
	Mar-05	ND	ND	ND	ND	ND	ND
	Dec-04	ND	ND	ND	ND	ND	ND
	Sep-04	ND	ND	2.6	ND	ND	ND
	May-04	ND	1.1	3.8	ND	ND	ND
	Feb-04	1.2	ND	3.8	ND	ND	ND
	Nov-03	1.7	ND	ND	ND	ND	ND
	Jun-03	ND	ND	4.2	ND	ND	ND
	Mar-03	3.3	3.1	2.4	7.7	ND	ND
	Dec-02	1.5	ND	ND	ND	ND	ND
	Sep-02	ND	ND	ND	ND	ND	ND
	Jun-02	1.4	1.9	55	3.2	ND	1.2
	Mar-02	1.9	ND	110	12	ND	4.8
	Dec-01	1.5	1	45	ND	ND	31
	Sep-01	2.0	ND	59	ND	ND	56
	May-01	1.3	ND	66	ND	ND	14
	Oct-00	3.1	3.4	78	10	ND	48
	Mar-00	ND	ND	16	ND	ND	10
	Dec-99	ND	ND	79	ND	ND	75
	Aug-99	ND	ND	88	ND	ND	50
	Aug-98	ND	ND	45	ND	NA	NA
	Nov-97	3.2	3.4	51.9	5.7	NA	22.2
	Jan-96	ND	429	ND	ND	NA	ND
MW-6	Oct-00	ND	ND	ND	ND	ND	ND
	Mar-00	ND	ND	ND	ND	ND	ND
	Dec-99	ND	ND	ND	ND	ND	ND
	Aug-99	ND	ND	ND	ND	ND	50
	Aug-98	ND	ND	ND	ND	NA	NA
	Nov-97	ND	ND	ND	ND	NA	1.61
	Jan-96	ND	ND	1.24	ND	NA	ND

Table 3

Historical Groundwater Sampling Results
Plains Marketing - Ingleside Facility

Monitor Well	date	Method 8020 or 8021					Method 8015 or TX 1005**
		ug/l					mg/l
		benzene	toluene	ethylbenzene	xylenes	MTBE	TPH
Tier 1 Residential PCL		5	1,000	700	10,000	240	-
MW-7	Sep-05	<0.10	1.6	<0.10	<0.20	1.5 J	<0.2
	Sep-04	ND	ND	ND	ND	ND	ND
	Sep-02	ND	ND	ND	ND	ND	0.77
	Sep-01	ND	ND	ND	ND	ND	ND
	Oct-00	1.4	ND	13	ND	ND	ND
	Mar-00	ND	ND	ND	ND	1.4	ND
	Dec-99	ND	ND	8.4	ND	5.2	4.2
	Aug-99	ND	ND	ND	ND	ND	50
	Aug-98	ND	ND	ND	ND	NA	NA
	Nov-97	ND	ND	2.2	1.6	NA	4.89
	Jan-96	6.02	4.7	2.81	2.09	NA	ND
MW-8	Sep-05	<0.10	<0.10	<0.10	<0.20	<0.35	<0.20
	May-05	11	0.85	41	0.99	2	3.2
	Mar-05	23	ND	30	ND	7.1	3.1
	Dec-04	13	1.2	23	ND	ND	5.01
	Sep-04	24	ND	19	4.4	9.8	4
	May-04	9.7	1.7	1.5	7.1	8.4	0.87
	Feb-04	26	2.9	53	11	ND	8.1
	Nov-03	23	2.1	54	12	ND	6.4
	Jun-03	120	14	100	85	350	6.1
	Mar-03	12	2.8	16	15	12	24
	Dec-02	17	1.1	18	8.4	10	22
	Sep-02	ND	ND	ND	ND	ND	7.7
	Jun-02	2.0	ND	ND	ND	15	1.0
	Mar-02	23	2	51	11	14	5.1
	Dec-01	28	2	39	11	5	11
	Sep-01	49	ND	32	ND	ND	ND
	May-01	100	2.3	37	5.9	ND	5.7
	Oct-00	120	1.8	66	23	ND	8.3
	Mar-00	210	2.9	55	11	3.1	18
	Mar-00*	200	2.9	49	10	3.2	5.5
	Dec-99	210	ND	32	ND	ND	27
	Dec-99*	210	ND	36	ND	ND	24
	Aug-99	230	ND	38	ND	ND	3.2
	Aug-98	210	ND	40	ND	NA	NA
	Nov-97	162	1.6	38.6	9.6	NA	10.8
	Jan-96	2,070	ND	ND	ND	NA	ND

Table 3

Historical Groundwater Sampling Results
Plains Marketing - Ingleside Facility

Monitor Well	date	Method 8020 or 8021					Method 8015 or TX 1005**
		ug/l					mg/l
		benzene	toluene	ethylbenzene	xylene	MTBE	TPH
Tier 1 Residential PCL		5	1,000	700	10,000	240	-
MW-10	Oct-00	ND	ND	2.6	ND	ND	ND
	Mar-00	1.5	4.2	12	22	1.1	22
	Dec-99	ND	6.7	15	24	ND	23
	Aug-99	2.1	5.7	5.0	29	ND	33
	Aug-98	5	2	25	28	NA	NA
	Nov-97	3.6	4.1	8.2	9.9	NA	22.7
	Nov-97*	3.2	3.6	7.3	10	NA	21.7
	Jan-96	14	24.8	6.92	22.2	NA	ND
MW-11	Sep-05	120	3.8	280	43	<0.35	9.6
	May-05	140	5.2	220	46	4.1	9.6
	Mar-05	100	3.7	97	38	ND	1.8
	Dec-04	130	2.9	110	60	6.3	9.2
	Sep-04	350	5.4	300	42	5.4	4.6
	May-04	350	10	320	140	ND	34.9
	Feb-04	310	6.5	200	64	ND	5
	Nov-03	390	3.4	170	79	3.7	8.4
	Jun-03	190	4.7	210	75	1.8	9.8
	Mar-03	70	3	73	57	5.4	39
	Dec-02	93	3.6	120	60	ND	16
	Sep-02	140	3.7	140	47	ND	8.5
	Jun-02	95	4.2	100	28	ND	0.86
	Mar-02	95	3.1	120	55	21	4.7
	Dec-01	99	14	77	84	ND	28
	Sep-01	210	5.8	170	74	ND	18
	May-01	150	3.5	120	26	ND	7.8
	Oct-00	290	6.0	190	41	6.3	9
	Mar-00	370	4.6	230	42	ND	19
	Dec-99	270	6.7	170	46	2.2	31
	Aug-99	480	13	330	200	ND	23
	Aug-98	900	ND	320	170	NA	NA
	Nov-97	969	ND	308	532	NA	95.7

Table 3

**Historical Groundwater Sampling Results
Plains Marketing - Ingleside Facility**

Monitor Well	date	Method 8020 or 8021					Method 8015 or TX 1005**
		ug/l					mg/l
		benzene	toluene	ethylbenzene	xylene	MTBE	TPH
Tier 1 Residential PCL		5	1,000	700	10,000	240	-
MW-12	Sep-05	0.71 J	<0.10	0.74 J	<0.20	6.1	<0.20
	May-05	<0.10	<0.10	0.79	<0.20	3.3	0.25
	Mar-05	ND	2.9	ND	ND	ND	ND
	Dec-04	ND	ND	ND	ND	ND	ND
	Sep-04	1.8	ND	ND	ND	7.5	ND
	May-04	ND	ND	ND	ND	ND	ND
	Feb-04	6.1	ND	2.7	4	11	ND
	Nov-03	18	1.2	4.7	1.2	ND	ND
	Jun-03	58	1.9	14	8.7	35	ND
	Mar-03	13	ND	1	ND	11	8.8
	Dec-02	8.9	2.4	ND	ND	9.3	ND
	Sep-02	9	ND	1	ND	8	ND
	Jun-02	16	ND	3.1	ND	24	0.10
	Mar-02	12	ND	2.2	ND	23	ND
	Dec-01	53	3	9	12	31	ND
	Sep-01	64	1.8	8.7	6.0	36	ND
	May-01	32	ND	5	4.1	30	ND
	Oct-00	23	ND	3.3	9.2	17	ND
	Mar-00	41	ND	4.3	3.7	19	23
	Dec-99	28	ND	2.8	3.0	18	6.2
	Aug-99	23	ND	ND	ND	11	6.5
	Aug-98	37	ND	12	ND	NA	NA
	Nov-97	11.2	ND	16	1.2	NA	6.15
MW-13	Sep-05	<0.10	<0.10	<0.10	<0.20	2.8 J	<0.20
	Sep-04	ND	ND	ND	ND	ND	ND
	Sep-02	ND	ND	6.6	ND	ND	ND
	Sep-01	ND	ND	ND	ND	28	ND
	Oct-00	ND	ND	ND	ND	28	ND
	Mar-00	ND	ND	ND	ND	22	0.95
	Dec-99	ND	ND	ND	ND	34	1.1
	Aug-99	ND	ND	ND	ND	33	1.0
	Aug-98	ND	ND	ND	ND	NA	NA

Table 3

Historical Groundwater Sampling Results
Plains Marketing - Ingleside Facility

Monitor Well	date	Method 8020 or 8021					Method 8015 or TX 1005**
		ug/l					mg/l
		benzene	toluene	ethylbenzene	xylene	MTBE	TPH
Tier 1 Residential PCL		5	1,000	700	10,000	240	-
MW-14	Sep-05	4.7	1.6	12	<.20	1.8 J	<0.20
	May-05	16	1.1	42	<.20	4.7	10.3
	Mar-05	20	ND	63	ND	ND	3.4
	Dec-04	5.5	ND	35	ND	ND	4.61
	Sep-04	9.3	ND	25	ND	ND	4.8
	May-04	28	2.3	54	10	12	19.1
	Feb-04	19	2.6	22	5.6	ND	ND
	Nov-03	14	1	22	3.3	ND	1.97
	Jun-03	35	1.5	58	9.3	10	14.4
	Mar-03	21	2.3	8.9	6.3	ND	9.8
	Dec-02	6.8	ND	12	ND	ND	8.1
	Sep-02	8	ND	19	ND	6	3.2
	Jun-02	83	2.3	54	ND	30	1.4
	Mar-02	45	1.8	48	9.7	15	4.9
	Dec-01	3.8	2	8	6	ND	ND
	Sep-01	10	ND	9.1	ND	ND	ND
	May-01	9.7	ND	10	4	ND	ND
	Oct-00	13	ND	7.7	3.8	ND	ND
	Mar-00	12	ND	9.8	4.4	2.1	20
	Dec-99	5	ND	13	ND	ND	4.3
	Aug-99	70	ND	11	ND	ND	9.6
Aug-98	21	ND	15	ND	NA	NA	
MW-15	Sep-05	<0.10	<0.10	<0.10	<0.20	<0.35	<0.20
	Sep-04	ND	ND	ND	ND	ND	ND
	Sep-02	ND	ND	3.4	ND	ND	ND
	Sep-01	ND	ND	ND	ND	ND	ND
	Oct-00	ND	ND	1.1	ND	ND	ND
	Mar-00	ND	ND	ND	ND	3.5	3.6
	Dec-99	ND	ND	ND	ND	ND	2.9
	Aug-99	ND	ND	ND	ND	ND	3.3
MW-16	Sep-05	<0.10	<0.10	<0.10	<0.20	<0.35	<0.20
	Sep-04	ND	ND	ND	ND	ND	ND
	Sep-02	ND	ND	ND	ND	ND	ND
	Sep-01	ND	ND	1.5	ND	ND	ND
	Oct-00	1.3	ND	1.7	ND	8.8	ND
	Mar-00	ND	ND	ND	ND	ND	0.52
	Dec-99	ND	ND	ND	ND	ND	4.5
	Aug-99	ND	ND	ND	ND	ND	1.3

Table 3

Historical Groundwater Sampling Results
Plains Marketing - Ingleside Facility

Monitor Well	date	Method 8020 or 8021					Method 8015 or TX 1005**
		ug/l					mg/l
		benzene	toluene	ethylbenzene	xylene	MTBE	TPH
Tier 1 Residential PCL		5	1,000	700	10,000	240	-
MW-17	Sep-05	<0.10	1.5	14	0.59 J	<0.35	<0.20
	May-05	4.7	1.3	71	<0.20	<0.35	3.36
	Mar-05	2.7	ND	20	ND	ND	ND
	Dec-04	6.8	ND	18	ND	ND	ND
	Sep-04	58	2.6	120	12	11	0.75
	May-04	51	2.1	47	5.1	8.9	7.1
	Feb-04	93	2.6	38	8.1	ND	1.2
	Nov-03	27	ND	8.4	ND	ND	ND
	Jun-03	55	1.4	45	ND	ND	ND
	Mar-03	13	1.6	19	ND	ND	ND
	Dec-02	3.5	2.4	3.3	ND	ND	ND
	Sep-02	ND	ND	3.4	ND	ND	1.0
	Jun-02	54	3.5	38	3.7	ND	0.58
	Mar-02	37	ND	22	ND	ND	1.9
	Dec-01	21	ND	14	ND	ND	ND
	Sep-01	18	ND	19	ND	ND	ND
	May-01	17	ND	12	ND	ND	ND
	Oct-00	310	41	1000	160	75	6.6
	Mar-00	140	1.2	24	4.1	ND	5.6
	Dec-99	84	ND	15	ND	ND	2.3
Aug-99	140	ND	40	7.2	ND	4.5	
MW-18	Sep-05	<0.10	<0.10	<.10	<0.20	9.3	<0.20
	May-05	<0.10	3.5	<0.10	0.57	<0.35	<0.20
	Mar-05	ND	ND	ND	ND	ND	ND
	Dec-04	ND	ND	ND	ND	ND	ND
	Sep-04	ND	ND	ND	ND	ND	ND
	May-04	ND	ND	ND	ND	ND	ND
	Feb-04	ND	ND	ND	ND	ND	ND
	Feb-03	ND	ND	ND	ND	ND	ND
	Nov-03	ND	ND	ND	ND	ND	ND
	Jun-03	ND	ND	ND	ND	ND	ND
	Mar-03	ND	ND	ND	ND	ND	ND
	Dec-02	ND	ND	6	ND	ND	ND
	Sep-02	ND	ND	ND	ND	ND	ND
	Jun-02	ND	ND	ND	ND	ND	ND
	Mar-02	ND	ND	ND	ND	ND	ND
	Dec-01	ND	ND	ND	ND	ND	ND
	Sep-01	ND	ND	ND	ND	ND	ND

Table 3

Historical Groundwater Sampling Results
Plains Marketing - Ingleside Facility

Monitor Well	date	Method 8020 or 8021					Method 8015 or TX 1005**
		ug/l					mg/l
		benzene	toluene	ethylbenzene	xylene	MTBE	TPH
Tier 1 Residential PCL		5	1,000	700	10,000	240	-
MW-19	Sep-05	<0.10	1.3	<0.10	<0.20	<0.35	<0.20
	May-05	<0.10	<0.10	<0.10	<0.20	<0.35	2.0
	Mar-05	ND	ND	ND	ND	ND	ND
	Dec-04	ND	ND	ND	ND	ND	ND
	Sep-04	ND	ND	ND	ND	ND	ND
	May-04	ND	ND	ND	ND	ND	ND
	Feb-04	ND	ND	2.5	ND	ND	ND
	Nov-03	ND	ND	ND	ND	ND	ND
	Jun-03	ND	ND	ND	ND	ND	ND
	Mar-03	ND	ND	ND	ND	ND	ND
	Dec-02	ND	ND	ND	ND	ND	ND
	Sep-02	ND	ND	ND	ND	ND	ND
	Jun-02	ND	ND	ND	ND	ND	ND
	Mar-02	ND	ND	ND	ND	ND	ND
	Dec-01	ND	ND	ND	ND	10	ND
GB-1	Jan-00	4	ND	5	3	ND	NA
GB-2	Jan-00	140	ND	27	ND	ND	NA
GB-3	Jan-00	ND	ND	ND	ND	ND	NA
GB-4	Oct-00	ND	ND	ND	ND	ND	ND
GB-5	Oct-00	17	ND	5.3	ND	ND	ND
GB-6	Oct-00	6.8	ND	ND	ND	ND	ND
GB-7	Oct-00	ND	ND	ND	ND	25	ND
GB-8	Oct-00	1.5	ND	ND	ND	88	ND
GB-9	Oct-00	ND	ND	ND	ND	10	ND

Notes:

ug/L micrograms per liter

mg/L milligrams per liter

ND not detected

NA not analyzed

GB-1 Geoprobe Hydropunch Sample

* duplicate sample result

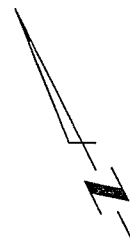
** beginning in the May 2001 data, all TPH analyses were performed using TX 1005 method

SUNRAY ROAD

PLAINS MARKETING

⊕ MW-18

⊕ MW-19



FEET
APPROX. SCALE

QUEST CONSULTING, INC.

6700 West Loop South, Ste. 310
Bellaire, Texas 77401

PHONE: (713) 667-6323 www.questehs.com FAX: (713) 667-6213

FIGURE 1

Site Diagram
Plains Marketing
September 12, 2005
Ingleside Facility
Ingleside, Texas

Plains Ingleside 02401

PROJECT No.: 02401

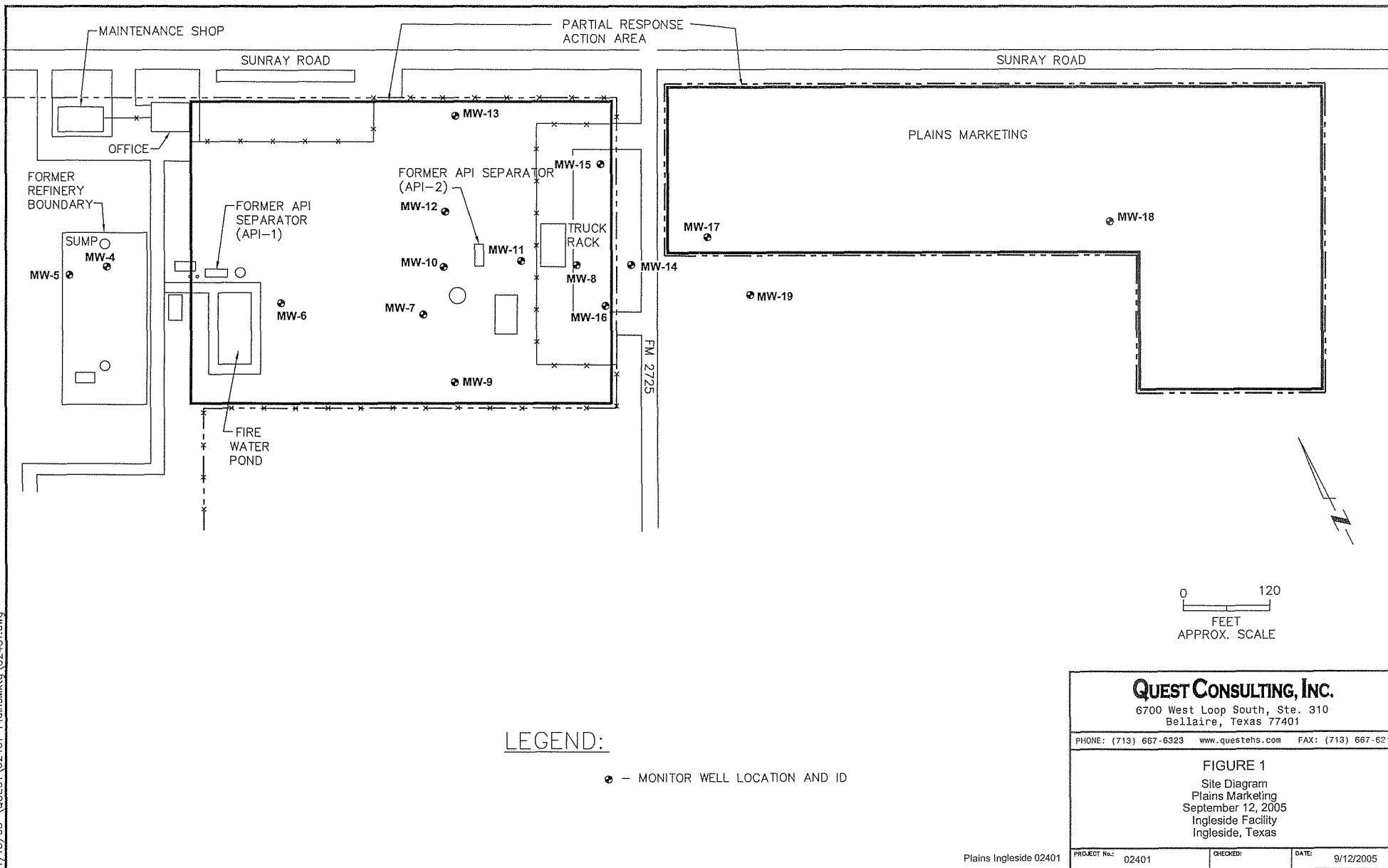
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DATE:

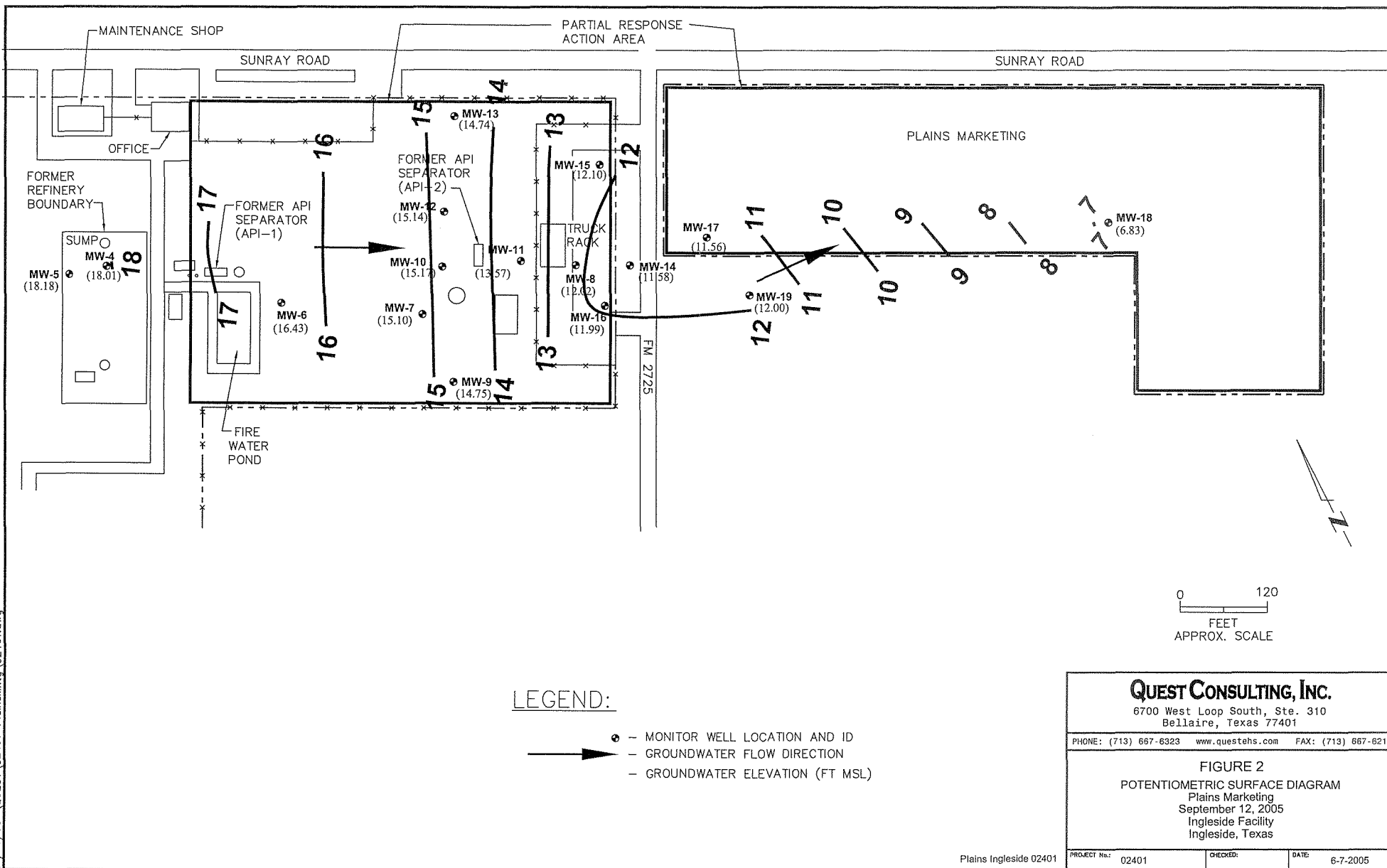
9/12/2005

.L LOCATION AND ID

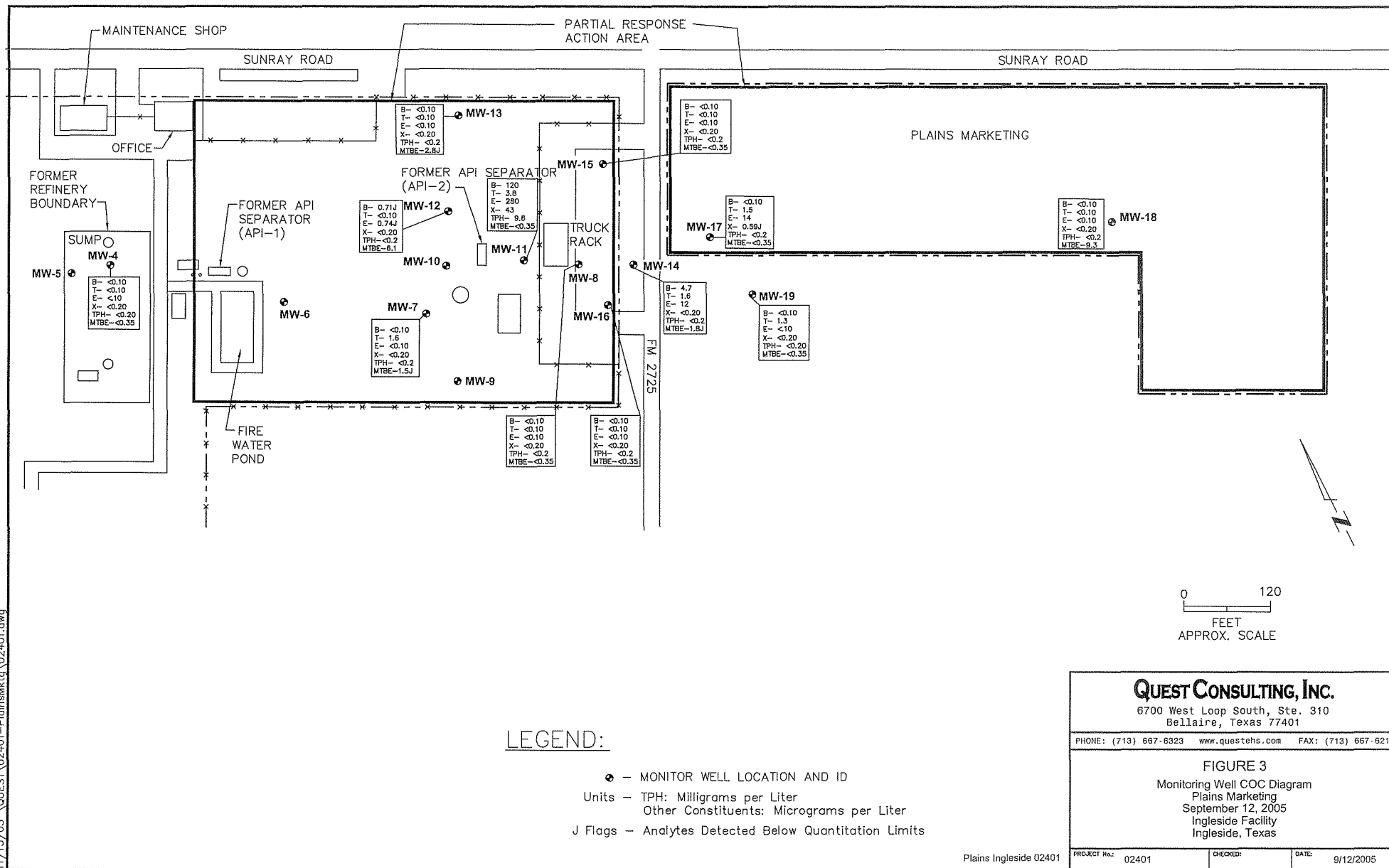
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11/13/03 \QUEST\02401-PlainsMktg\02401.dwg



11/13/03 \QUEST\02401-PlainsMktg\02401.dwg



Plains Ingleside 02401

APPENDIX F

RICHARD F. BERGNER & ASSOCIATES

ATTORNEYS AT LAW
5718 WESTHEIMER, SUITE 700
HOUSTON, TEXAS 77057

RICHARD F. BERGNER
rbergner@flash.net

TELEPHONE (713) 783-4832
FACSIMILE (713) 783-2502

June 27, 2003

Mr. Jeffrey C. Lewellin
Emergency Response Coordinator
Field Operations Division
Texas Commission on Environmental Quality
Region 14
Corpus Christi, Texas

Via Facsimile Transmission 361 825-3101

Dear Jeff:

As we discussed this morning, National Oil Recovery Corporation was served with a letter dated February 5, 2003, from the United States Environmental Protection Agency Region 6, Dallas, Texas, regarding information requested pursuant to Section 308 of the Clean Water Act. A copy of this letter is attached.

I retained John Perabo of Miller Environmental Services, Inc. to supply me with the information requested by the EPA, and, utilizing such information from him, I responded to the EPA's inquiry by letter dated March 7, 2003. A copy of my letter to Mr. Roberto Bernier is also attached.

Attached to the letter to Mr. Bernier are the Attachments 1 and 2 referenced in my letter. However, the photographs referenced in Attachment 3 are not attached; they are color photographs and I do not have a color copier. If you need copies of those photographs, I suggest you contact Mr. Perabo, who has the originals.

If you need any additional information regarding the clean-up, please advise.

I can confirm to you that National Oil Recovery Corporation's corporate address has not changed. The office telephone number has changed. It is (718) 886-0994.

Very truly yours,



Richard F. Bergner

RFB:sjh
Enclosures



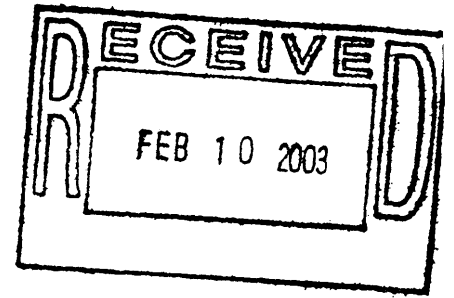
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

February 5, 2003

CERTIFIED MAIL, RETURN RECEIPT REQUESTED

7001 0360 0003 6671 9070



Mr. Richard Bergner
Norco Oil
5718 Westheimer
Suite 700
Houston, TX 77057

RE: Clean Water Act, Section 308 Information Request
Oil Spill in San Patricio County, Texas on or about September 20, 2002
NRC Report No: 623560

Dear Mr. Bergner:

Pursuant to Section 308 of the Clean Water Act (CWA), 33 U.S.C. Section 1318 et seq., the United States Environmental Protection Agency (EPA) has the authority to request information pertinent to carrying out its responsibilities under the CWA. Accordingly, this Information Request is hereby served on you and Norco Oil.

Compliance with the provisions of this letter is mandatory. Your responses to the questions are to be submitted to EPA and postmarked within thirty (30) days of receipt of this letter. The response must be signed by a duly authorized official of Norco Oil. The information will be considered in the evaluation of the extent of your compliance with the federal regulations governing the discharge, or threat of discharge, of hazardous substances, pollutants, or contaminants into navigable waters of the United States.

Failure to respond fully and truthfully to the Information Request, or to adequately justify such failure to respond, will be considered a violation of Section 309 of the CWA, as amended by the Water Quality Act of 1987, which can result in enforcement action by EPA. Section 309 of the CWA permits EPA to seek the imposition of civil and criminal penalties for failure to submit information requested under Section 308 of the CWA, including issuance of an Administrative Penalty Order or referral to the United States Department of Justice for judicial action with monetary fines. Please be further advised that providing false, misleading, or fraudulent statements or representations, may subject you to criminal penalties under Section 309 of the CWA.

Internet Address (URL) - <http://www.epa.gov/earth1r6>

Recycled/Recyclable - Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 30% Postconsumer)

This Information Request is not subject to the approval requirements of the Paperwork Reduction Act, of 1980, as amended, 44 U.S.C. Section 3501, et. seq., as described in 5 CFR Part 1320.3(c).

You are hereby requested to provide the following information regarding the oil spill which occurred on or about September 20, 2002 in San Patricio County, Texas:

1. A report regarding the spill of crude oil into a water body which occurred on or about September 20, 2002. (If the name of the water body is not available, use the best description available.)
2. The amount of product spilled (in either barrels or gallons).
3. Duration of the spill event. Report the time and date the spill began, how long the product remained in the watercourse, as well as on the shoreline or banks and when the cleanup operations were considered complete and all product removed from waters of the United States and adjoining shoreline.
4. The cause of the spill.
5. Name of the immediate receiving ditch, creek, stream, river, lake, arroyo, swale, etc. if known.
 - A. Also include the names of all downstream receiving waters that the spill affected.
 - B. Additionally, list all downstream receiving water bodies to the first major river or lake, regardless of whether or not the spill affected the water bodies.
6. Site location map.
7. Drawing of the site showing locations of the facilities.
8. Sketch of the spill site showing extent of the spill.
9. Photographs of the spill and the spill site both before and after cleanup.

In some instances, information requested by EPA may be considered confidential business information (CBI) by the provider of that information. Should any of the information requested by EPA as part of this request for information be considered CBI material by Norco Oil, you must assert that claim as part of your reply. The final determination regarding this material will be made by EPA per the regulations found in 40 CFR Part 2.204.

Please mail your response to the following address:

Mr. Roberto Bernier
Superfund Division (6SF-RO)
U. S. EPA Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

If you have any questions relating to this Information Request, please contact Mr. Roberto Bernier at (214) 665-8376.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Charles A. Gazda", with a stylized flourish at the end.

Charles A. Gazda
Chief, Response & Prevention Branch
Superfund Division

RICHARD F. BERGNER & ASSOCIATES

ATTORNEYS AT LAW
5718 WESTHEIMER, SUITE 700
HOUSTON, TEXAS 77057

RICHARD F. BERGNER
rbergner@flash.net

TELEPHONE (713) 783-4832
FACSIMILE (713) 783-2502

March 7, 2003

Mr. Roberto Bernier
Superfund Division (6SF-RO)
U.S. E.P.A. Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Via Certified Mail/Return Receipt Requested

Dear Mr. Bernier:

On behalf of National Oil Recovery Corporation ("Norco"), I am responding to Mr. Charles A. Gazda's letter of February 5, 2003, requesting information under Section 308 of the Clean Water Act relative to an oil spill at the Norco Refinery on or about September 20, 2002.

Although Mr. Gazda's letter is dated February 5, 2003, it was not received by me until February 10, 2003.

The inquired-about oil spill occurred at the Norco Refinery in Ingleside, Texas, on or about Friday, September 20, 2002.

Miller Environmental Services, Inc., Corpus Christi, Texas, under the supervision of Mr. John Perabo, was contacted to assess and remediate this oil spill. In view of such, I contacted Mr. Perabo, sent him a copy of Mr. Gazda's letter of February 5, 2003, and requested that he supply me with the answers to the questions propounded and the drawing, sketch and photographs requested in Mr. Gazda's letter.

Based on the information supplied by Mr. Perabo, I am responding to the nine items posed by Mr. Gazda in the order posed, as follows:

- (1) The crude oil that spilled from Tank 7 at the Norco Refinery did not enter a water body.
- (2) The amount of crude oil that was spilled or released was approximately five hundred gallons.
- (3) The crude oil spill began on Friday, September 20, 2003. All free liquid outside the facility was recovered the first day. After that, the remaining work was the removal of oil from inside the facility dike walls, lowering the level inside the Tank 7 from which the oil was released,

March 7, 2003

Page Two

and the removal of the oil stained soil in the tank farm and ditches outside the tank farm along FM 2725. This work was completed on October 4, 2002.

(4) The cause of the spill was due to heavy rains. Water leaked into Tank 7, causing oil to rise and flow out the vents at the top of the tank.

(5) The oil affected the ditch along FM 2725 between Sunray Road and Bishop Road/CR 4714

A. There was no downstream body of water that was affected.

B. Redfish Bay is the nearest body of water that could have been affected, but was not.

(6) Site Location Map. See attachment #1.

(7) Drawing of the site showing locations of the facilities. See attachment #2.

(8) Sketch of the spill site showing extent of the spill. See attachment #2.

(9) Photographs of the spill and the spill site both before and after cleanup. See attachment #3.

If I can be of further assistance in this matter, please advise.

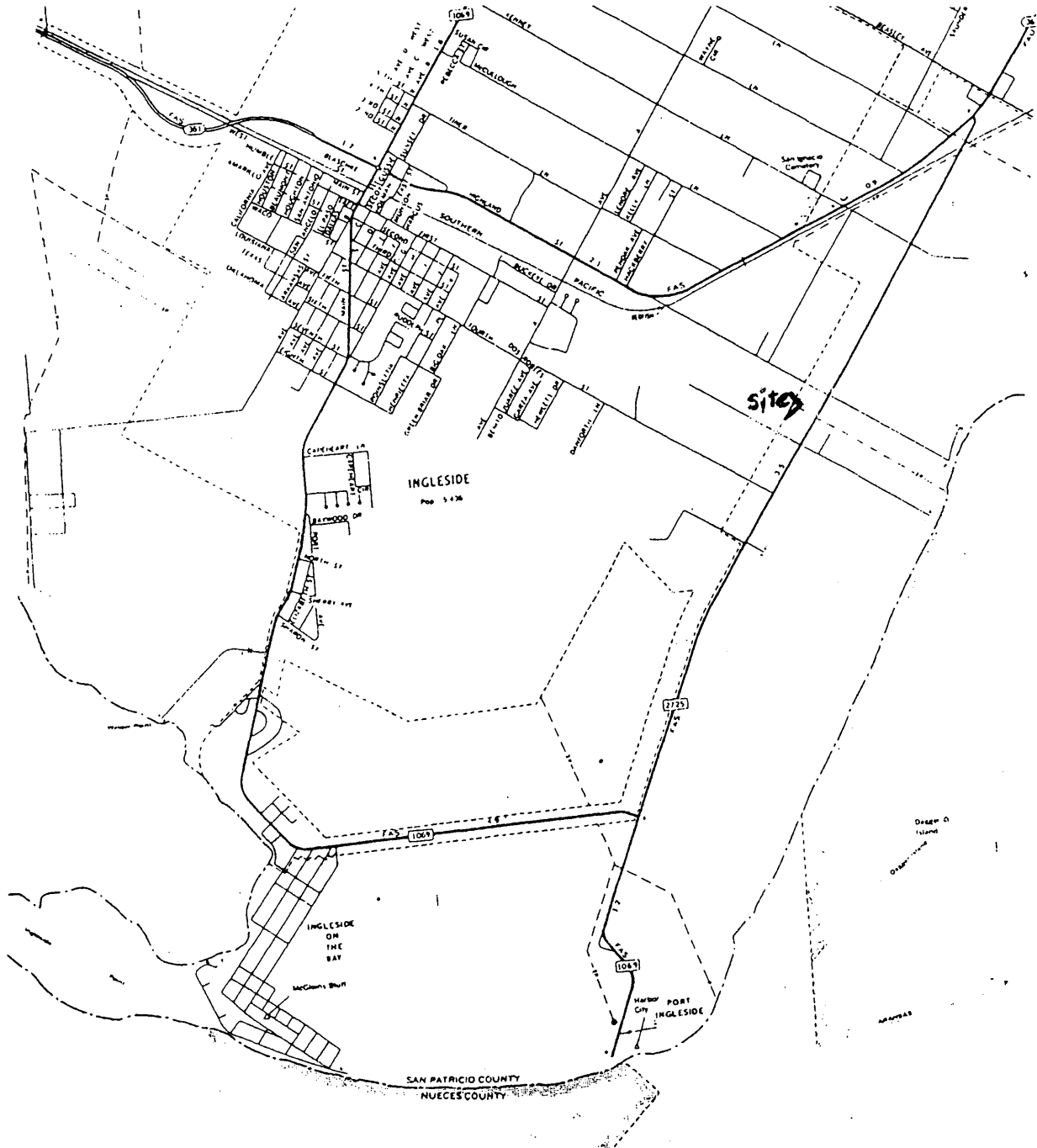
Very truly yours,

Richard F. Bergner
Attorney for National Oil Recovery Corporation

RFB:sjh
Enclosures

bcc: Mr. Solfred Maizus
w/ Enclosures

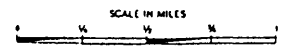
GENERAL LOCATION MAP



GENERAL HIGHWAY MAP SUPPLEMENTARY SHEET SHOWING DETAIL OF CITIES AND TOWNS SAN PATRICIO COUNTY TEXAS



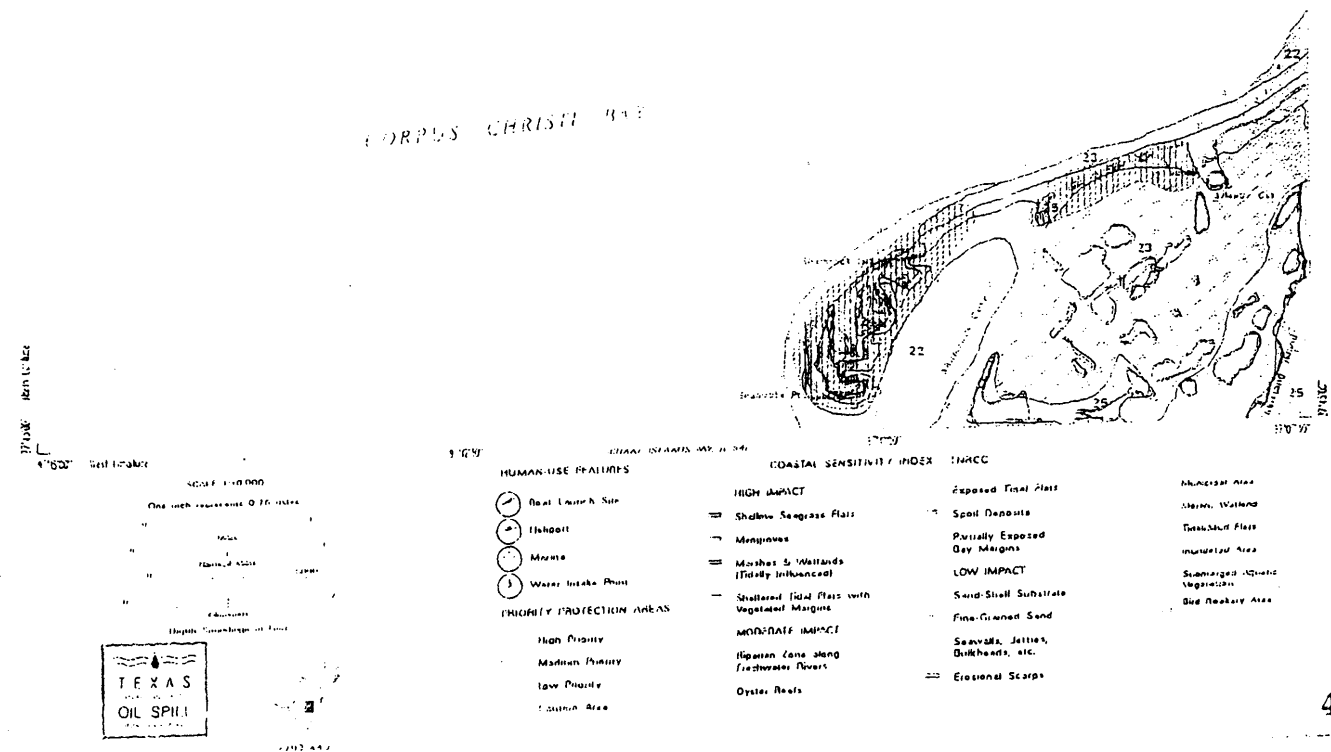
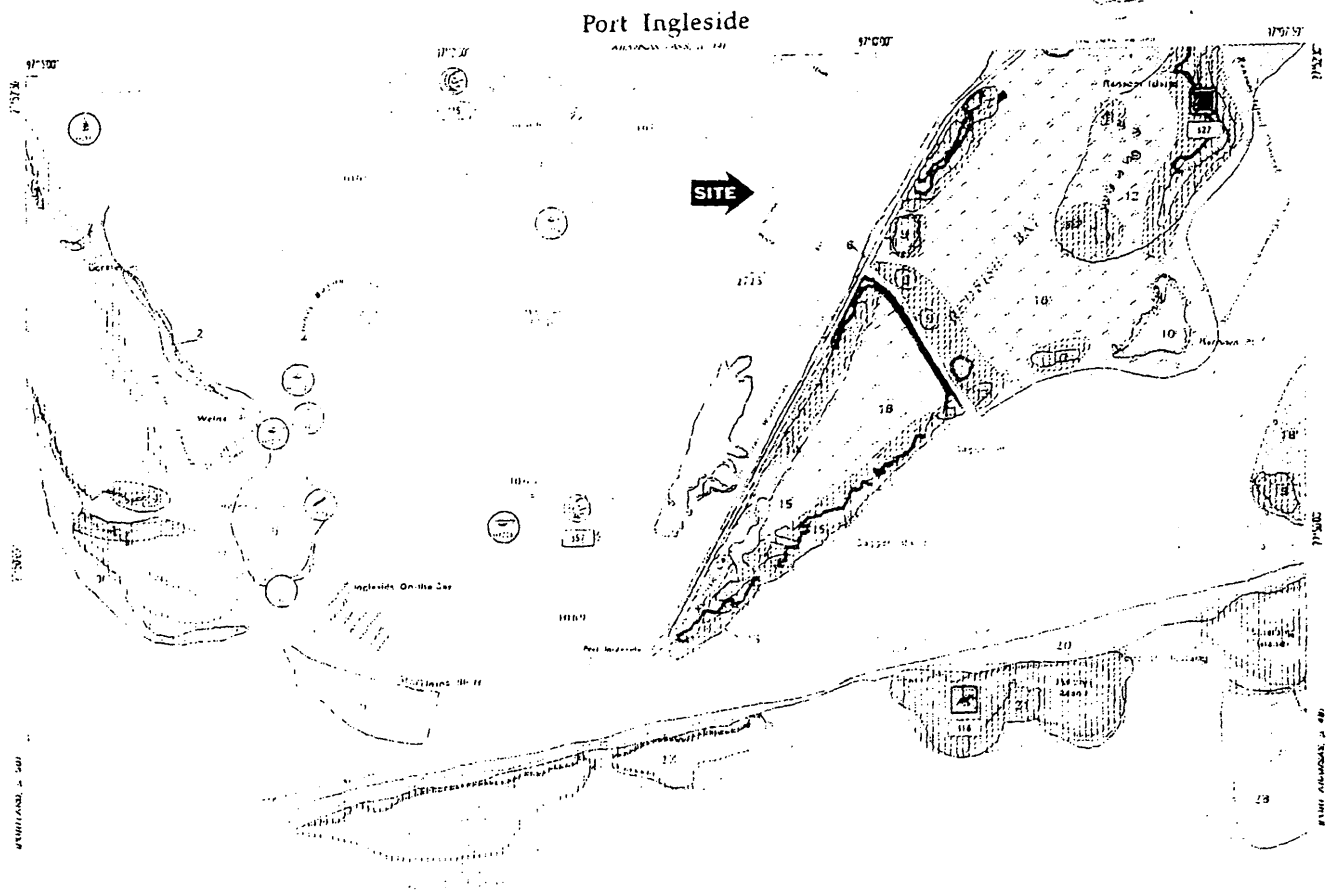
PREPARED BY THE
STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION
TRANSPORTATION PLANNING DIVISION
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

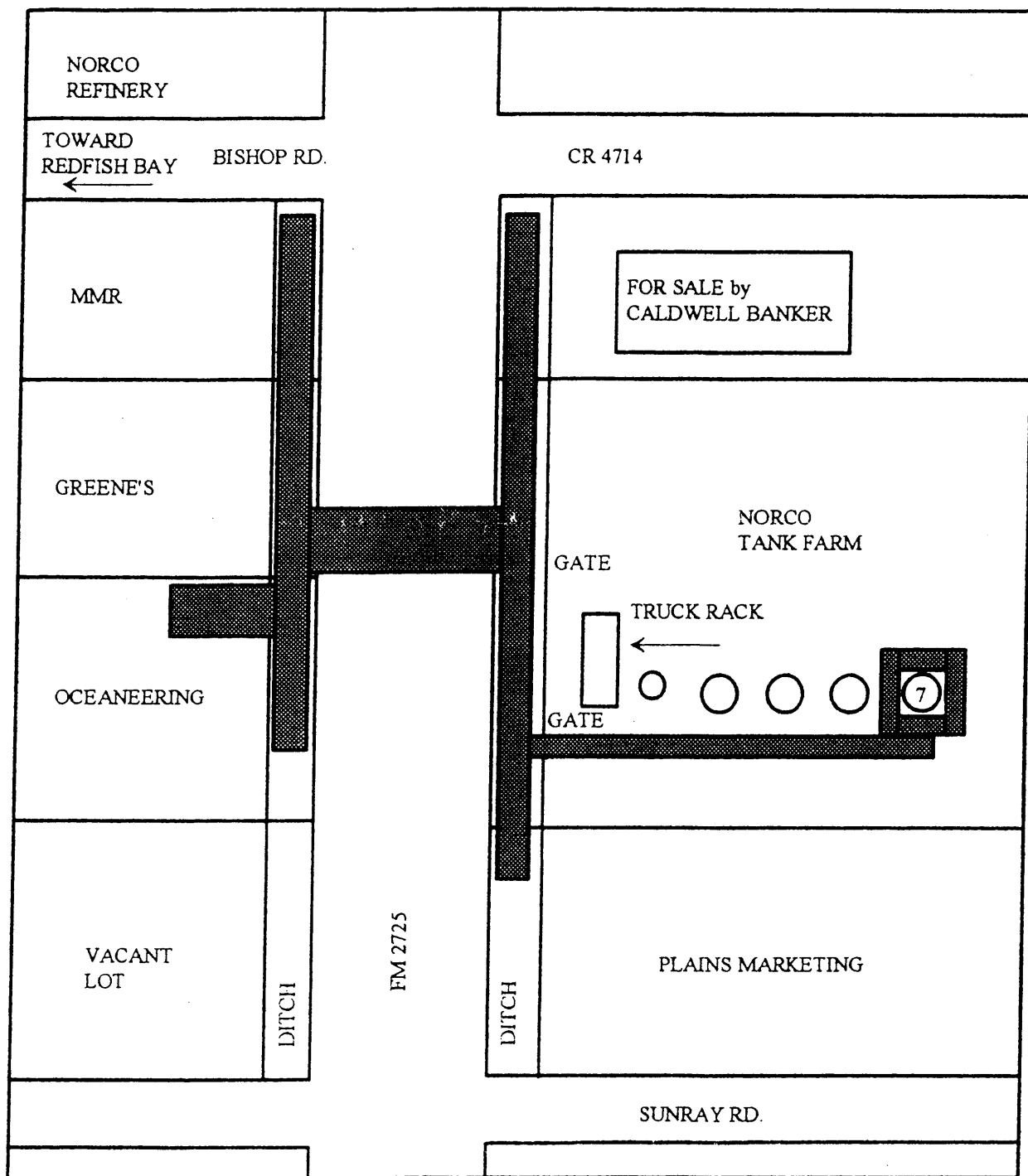


1970

1980 CENSUS FIGURES

HIGHWAYS REVISED TO FEBRUARY 1 1987





EXPLANATION



SPILL AREA



STORAGE TANKS

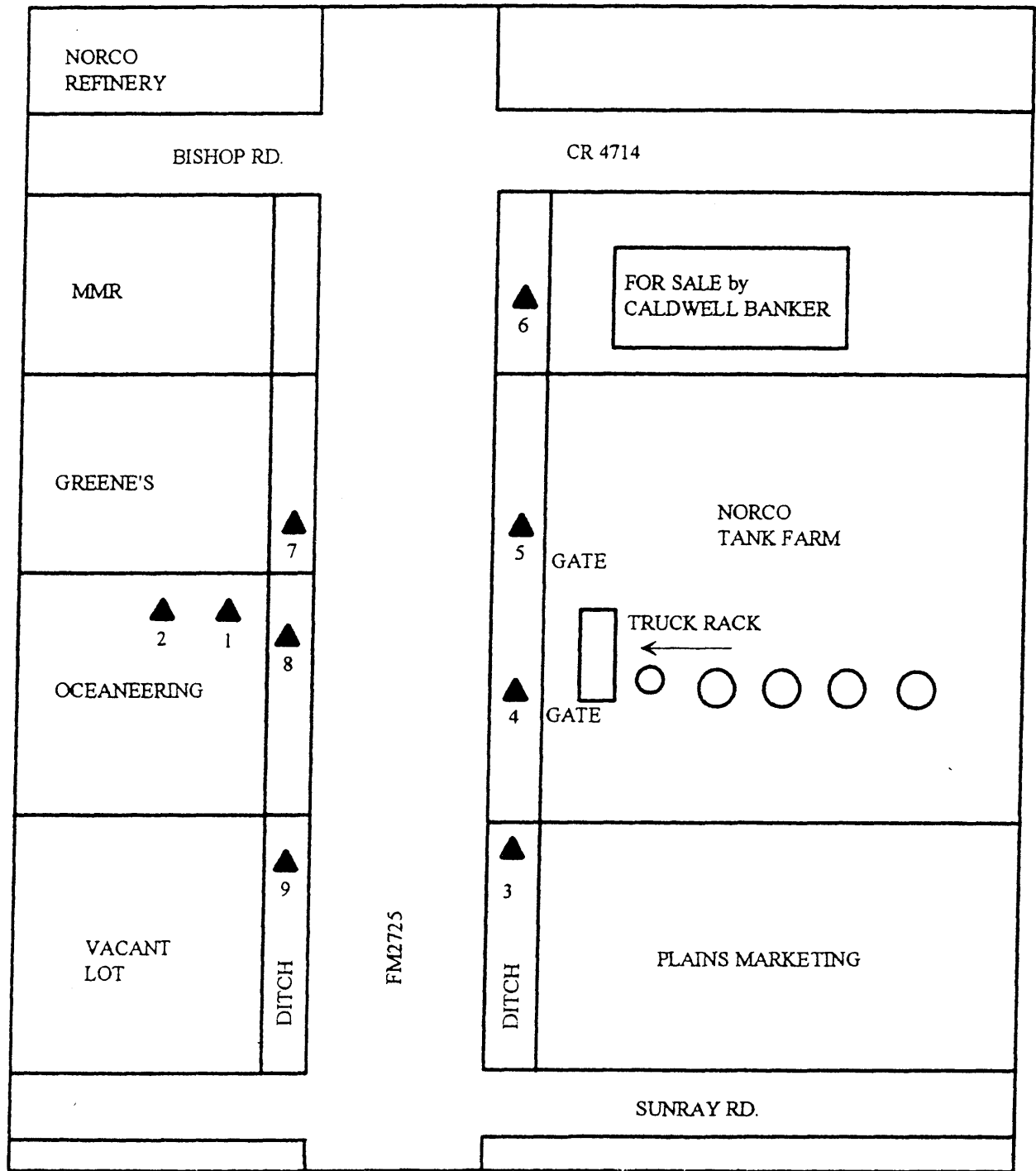




DRAWING IS NOT
TO SCALE

SPILL SITE MAP
for
NORCO OIL
FM 2725 BETWEEN SUNRAY RD.
AND BISHOP RD.
SAN PATRICIO COUNTY
INGLESIDE, TEXAS

MILLER ENVIRONMENTAL
SERVICES, INC.





<p>EXPLANATION</p> <p>▲ SAMPLE POINT</p> <p>○ STORAGE TANKS</p> <p></p> <p>DRAWING IS NOT TO SCALE</p>	<p>SAMPLE LOCATION MAP for NORCO OIL FM 2725 BETWEEN SUNRAY RD. AND BISHOP RD. SAN PATRICIO COUNTY INGLESIDE, TEXAS</p> <p>MILLER ENVIRONMENTAL SERVICES, INC. </p>
---	--

LABORATORY TEST RESULTS

Job Number: 215518

Date: 10/28/2002

CUSTOMER: Miller Environmental Services

PROJECT: NORCO

ATTN: JONAH PERABO

Customer Sample ID: 1 SOIL
Date Sampled.....: 10/17/2002
Time Sampled.....: 16:20
Sample Matrix.....: Soil

Laboratory Sample ID: 215518-1
Date Received.....: 10/17/2002
Time Received.....: 17:13

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
TCEQ TX1005	Petroleum Hydrocarbons Extraction n-Pentane Extraction - Solids & Wastes	Complete			10/21/02	rjt
TCEQ TX1005	Total Petroleum Hydrocarbons	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (C6 to C12), Solid	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (>C12 to C28), Solid	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (>C28 to C35), Solid	ND	50	mg/Kg	10/21/02	rjt
	TPH (C6 to C35), Solid	ND	50	mg/Kg	10/21/02	rjt

LABORATORY TEST RESULTS

Job Number: 215518

Date: 10/28/2002

CUSTOMER: NITEL Environmental Services

PROPERTY: NORCO

ATTN: John Parabo

Customer Sample ID: 2 SOIL

Date Sampled.....: 10/17/2002

Time Sampled.....: 16:22

Sample Matrix.....: Soil

Laboratory Sample ID: 215518-2

Date Received.....: 10/17/2002

Time Received.....: 17:13

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
TCEQ TX1005	Petroleum Hydrocarbons Extraction n-Pentane Extraction - Solids & Wastes	Complete			10/21/02	rjt
TCEQ TX1005	Total Petroleum Hydrocarbons	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (C6 to C12), Solid	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (>C12 to C28), Solid	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (>C28 to C35), Solid	ND	50	mg/Kg	10/21/02	rjt
	TPH (C6 to C35), Solid	ND	50	mg/Kg	10/21/02	rjt

LABORATORY TEST RESULTS

Job Number: 215518

Date: 10/28/2002

CUSTOMER: Miller Environmental Services

PROJECT: HGRSD

ATTN: John Perabo

Customer Sample ID: 3 SOIL
Date Sampled.....: 10/17/2002
Time Sampled.....: 16:26
Sample Matrix.....: Soil

Laboratory Sample ID: 215518-3
Date Received.....: 10/17/2002
Time Received.....: 17:13

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
TCEQ TX1005	Petroleum Hydrocarbons Extraction n-Pentane Extraction - Solids & Wastes	Complete			10/21/02	rjt
TCEQ TX1005	Total Petroleum Hydrocarbons	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (C6 to C12), Solid	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (>C12 to C28), Solid	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (>C28 to C35), Solid	ND	50	mg/Kg	10/21/02	rjt
	TPH (C6 to C35), Solid	ND	50	mg/Kg	10/21/02	rjt

LABORATORY TEST RESULTS

Job Number: 215518

Date: 10/28/2002

CUSTOMER: Miller Environmental Services

PROJECT: WQRCO

ATTN: John Perabo

Customer Sample ID: 4 SOIL
 Date Sampled.....: 10/17/2002
 Time Sampled.....: 16:28
 Sample Matrix.....: Soil

Laboratory Sample ID: 215518-4
 Date Received.....: 10/17/2002
 Time Received.....: 17:13

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
TCEQ TX1005	Petroleum Hydrocarbons Extraction n-Pentane Extraction - Solids & Wastes	Complete			10/21/02	rjt
TCEQ TX1005	Total Petroleum Hydrocarbons	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (C6 to C12), Solid	74	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (>C12 to C28), Solid	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (>C28 to C35), Solid	74	50	mg/Kg	10/21/02	rjt
	TPH (C6 to C35), Solid					

LABORATORY TEST RESULTS

Job Number: 215518

Date: 10/28/2002

CUSTOMER: Miller Environmental Services

PROJECT: NORCO

ATTN: John Perabo

Customer Sample ID: 5 SOIL
Date Sampled.....: 10/17/2002
Time Sampled.....: 16:32
Sample Matrix.....: Soil

Laboratory Sample ID: 215518-5
Date Received.....: 10/17/2002
Time Received.....: 17:13

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
TCEQ TX1005	Petroleum Hydrocarbons Extraction n-Pentane Extraction - Solids & Wastes	Complete			10/21/02	rjt
TCEQ TX1005	Total Petroleum Hydrocarbons	ND	50	mg/Kg	10/22/02	rjt
	Petroleum Hydrocarbons (C6 to C12), Solid	87	50	mg/Kg	10/22/02	rjt
	Petroleum Hydrocarbons (>C12 to C28), Solid	63	50	mg/Kg	10/22/02	rjt
	Petroleum Hydrocarbons (>C28 to C35), Solid	150	50	mg/Kg	10/22/02	rjt
	TPH (C6 to C35), Solid					

LABORATORY TEST RESULTS

Job Number: 215518

Date: 10/28/2002

CUSTOMER: Miller Environmental Services

PROJECT: NORCO

ATTN: John Pefabo

Customer Sample ID: 6 SOIL
Date Sampled.....: 10/17/2002
Time Sampled.....: 16:36
Sample Matrix.....: Soil

Laboratory Sample ID: 215518-6
Date Received.....: 10/17/2002
Time Received.....: 17:13

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
TCEQ TX1005	Petroleum Hydrocarbons Extraction n-Pentane Extraction - Solids & Wastes	Complete			10/21/02	rjt
TCEQ TX1005	Total Petroleum Hydrocarbons					
	Petroleum Hydrocarbons (C6 to C12), Solid	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (>C12 to C28), Solid	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (>C28 to C35), Solid	ND	50	mg/Kg	10/21/02	rjt
	TPH (C6 to C35), Solid	ND	50	mg/Kg	10/21/02	rjt

LABORATORY TEST RESULTS

Job Number: 215518

Date: 10/28/2002

CUSTOMER: Miller Environmental Services

PROJECT: NORCO

ATTN: John Perabo

Customer Sample ID: 7 SOIL

Date Sampled.....: 10/17/2002

Time Sampled.....: 16:38

Sample Matrix.....: Soil

Laboratory Sample ID: 215518-7

Date Received.....: 10/17/2002

Time Received.....: 17:13

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
TCEQ TX1005	Petroleum Hydrocarbons Extraction n-Pentane Extraction - Solids & Wastes	Complete			10/21/02	rjt
TCEQ TX1005	Total Petroleum Hydrocarbons					
	Petroleum Hydrocarbons (C6 to C12), Solid	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (>C12 to C28), Solid	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (>C28 to C35), Solid	ND	50	mg/Kg	10/21/02	rjt
	TPH (C6 to C35), Solid	ND	50	mg/Kg	10/21/02	rjt

LABORATORY TEST RESULTS

Job Number: 215518

Date: 10/28/2002

CUSTOMER: Nutter Environmental Services PROJECT: WORO ATTN: John Perabo

Customer Sample ID: 8 SOIL
Date Sampled.....: 10/17/2002
Time Sampled.....: 16:41
Sample Matrix.....: Soil

Laboratory Sample ID: 215518-8
Date Received.....: 10/17/2002
Time Received.....: 17:13

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
TCEQ TX1005	Petroleum Hydrocarbons Extraction n-Pentane Extraction - Solids & Wastes	Complete			10/21/02	rjt
TCEQ TX1005	Total Petroleum Hydrocarbons	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (C6 to C12), Solid	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (>C12 to C28), Solid	ND	50	mg/Kg	10/21/02	rjt
	Petroleum Hydrocarbons (>C28 to C35), Solid	ND	50	mg/Kg	10/21/02	rjt
	TPH (C6 to C35), Solid	ND	50	mg/Kg	10/21/02	rjt

LABORATORY TEST RESULTS

Job Number: 215518

Date: 10/28/2002

CUSTOMER: Miller Environmental Services

PROJECT: NORCO

ATTN: John Perabo

Customer Sample ID: 9 SOIL BACKGROUND
Date Sampled.....: 10/17/2002
Time Sampled.....: 16:45
Sample Matrix.....: Soil

Laboratory Sample ID: 215518-9
Date Received.....: 10/17/2002
Time Received.....: 17:13

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
TCEQ TX1005	Petroleum Hydrocarbons Extraction n-Pentane Extraction - Solids & Wastes	Complete			10/21/02	rjt
TCEQ TX1005	Total Petroleum Hydrocarbons	ND	50	mg/Kg	10/22/02	rjt
	Petroleum Hydrocarbons (C6 to C12), Solid	ND	50	mg/Kg	10/22/02	rjt
	Petroleum Hydrocarbons (>C12 to C28), Solid	ND	50	mg/Kg	10/22/02	rjt
	Petroleum Hydrocarbons (>C28 to C35), Solid	ND	50	mg/Kg	10/22/02	rjt
	TPH (C6 to C35), Solid					

APPENDIX G

**12/15/06 REMOVAL ACTION WORKPLAN ADDENDUM
NO. 1A**

Introduction

On May 23, 2006 an addendum work plan was submitted to the EPA to perform pipeline clean out and abandonment, in compliance with the approved Removal Action Work Plan for the Falcon Refinery Superfund Site, which is dated June 29, 2004. A copy of the addendum work plan is provided in Appendix A of this document. After reviewing the work plan the EPA On-Scene Coordinator (OSC) approved the plan with the required changes that are provided in Appendix B. Maps showing the locations of the pipeline cuts can be found in the addendum work plan in Appendix A.

Figures 1 and 2 are pipeline maps that depict the pipelines from the refinery to the current and former barge dock facilities. Figure 1, which has a photographic background shows the pipelines, photographs of the pipelines and includes photographs of the clean out activities. Figure 2 traces each pipeline and shows the diameters of current and former NORCO pipelines. Requests for information from adjoining pipeline operators about the diameters and specific routing of their pipelines resulted in no useful information,

This report describes the implementation of the addendum work plan.

The EPA OSC was provided five days notice of the pipeline cleanout and abandonment.

Pipeline Background

Prior to pipeline clean out and abandonment activities the Kleinfelder on-site manager had inventoried seven above ground pipelines that paralleled Bishop Road as noted in the work plan (Appendix A). Only six of the pipelines extend the full distance from the refinery to the point that the pipelines go underground. However, as excavating and pipeline cutting began four additional pipelines were discovered resulting in a total of 11 pipelines, including an active 8-inch pipeline that lies immediately adjacent to the abandoned pipelines.

Photo 1 shows the above ground pipelines that parallel Bishop Road, including in order from left to right in the photo an 8-inch, 12-inch, 8-inch, two 6-inch and then the active 8-inch pipeline that is nearest Bishop Road.

Photo 2 shows the pipelines at the point that they go underground. As shown, the 8-inch line (left side of photo) was capped prior to clean out operations. The remaining above ground pipelines are visible along with two 10-inch pipelines that were apparently used formerly and no longer extend beyond the bushes in the photo. Again the active line is visible on the right side of the photo.

Figures 1 and 2 are views of the entire length of each of the pipelines, which are amended from previous submissions to the EPA. The depicted locations are based on interviews

with TCEQ and Railroad Commission of Texas (RRC) staff that were involved in investigations dealing with the pipelines and a corrosion mitigation survey.

An inspector for the RRC performed an investigation of the pipelines in the area and traced the pipelines from Bishop Road to the former barge dock facility with pipeline locating equipment. The pipeline route that he detected is shown on Figures 1 and 2 and a hand sketch of his mapping was in the document record.

The RRC inspector could not trace the pipelines all the way to the intercoastal waterway due to the concrete cover and the large amounts of metal in that area of the former docking facility. The inspector indicated that to find the exact point where the pipelines were plugged and abandoned would be very expensive and would require breaking out the concrete cover to locate the lines.

After the pipeline clean out and abandonment NORCO hired Wendell and Associates to perform a Corrosion Mitigation Survey of the active 8-inch pipeline that connects the refinery to the current barge dock facility. A copy of the report is included in Appendix D of this addendum.

Results of the survey included a detailed map showing the location of the 8-inch pipeline, which is different from the location that NORCO was previously provided. The survey also provided the names of three pipelines that cross the NORCO pipeline, which include two pipelines owned by Gulf South and one owned by Boss Pipeline. In addition Plains Marketing owns a pipeline that runs through the wetlands adjacent to the refinery and ends at the barge dock facility at the end of Bishop Road. A release from the current Plains pipeline (formerly ARM) caused the release of significant amounts of waste into the wetlands. A description of the release is in the Falcon Refinery document record.

Safety and Health

Prior to each day's activities a safety tailgate meeting was held and the procedures outlined in the approved Safety and Health Plan were followed. On-site safety equipment for the pipeline clean out and abandonment included hard hats, steel toe boots, gloves, safety glasses, an explosive meter, photoionization detector (PID), fire extinguishers, absorbent material, oil booms and a first aid kit. Paul Supak (Kleinfelder) was the designated Site Safety Officer for the pipeline activities. All on site personnel had 40-hour HAZWOPER training and valid 8-hour refresher training. Personal protective equipment (PPE) also included organic vapor respirators.

No excavations extended deeper than four feet and as a result shoring was not required.

Pipeline Cleanout Activities

The following chronology of activities is provided.

Monday, June 12

Prior to the initiation of field activities the on-site personnel, which included Paul Supak (Kleinfelder), Casey Wills (USA Environmental (USA)) and Marlin Fuller (USA) held a site safety meeting and discussed the location and the numbers of emergency services. Prior to mobilizing a line locator had been called and utilities in the area were marked. After the safety meeting a thorough site reconnaissance was performed of all pipeline locations and block valves.

During the reconnaissance a nest of bees was found in one of the pipelines and an exterminator (PestPatrol) was called to remove the nest from the pipe.

The remainder of the day until 6:00 pm was spent using the USA line locator to trace the pipelines from Bishop Road (where they go underground) to the planned clean out and abandonment point near Sunray Road. Photo 1 shows the above ground pipelines that lead from the refinery to Bishop Road where the pipelines go underground.

Tuesday, June 13

Paul Supak, Casey Wills and Marlin Fuller held a safety meeting to discuss the planned activities for the day and the possible hazards that could be encountered.

Holes were carefully drilled into the tops of the three pipelines located inside a concrete containment near Bishop Road (Photo 3). After drilling the holes an explosimeter and PID were used to monitor the volatile vapors. In the westernmost pipeline vapors were recorded at concentrations of 20 ppm and the Lower Explosive Limit (LEL) was >10%. The pipeline was allowed to vent and was re-evaluated to ensure a safe condition prior to cutting.

Prior to cutting the pipelines Phillip Service Corporation (PSC) provided a vacuum truck to remove any liquid detected in the pipelines or to recover any spilled liquid. When one of the pipelines in the concrete containment was cut, approximately 20 gallons of liquid were released into the concrete containment (Photo 3) and the vacuum truck was used to remove the liquid. No liquid was spilled on the ground. Excavation began at this location (Photo 4).

Additional pipelines, some of which were in poor condition were cut and work stopped at 6:30 pm.

Wednesday, June 14

Paul Supak, Casey Wills and Marlin Fuller held a safety meeting to discuss the planned activities for the day and the possible hazards that could be encountered.

USA continued to cut pipelines at the Bishop Road location and a PSC vacuum truck was at the site to remove liquid from the pipelines.

The EPA RPM and a representative of the TCEQ witnessed activities.

Addition pipeline location activities were performed with the help of a Superior Crude Gathering (Superior) employee. Superior leases tanks at the refinery and uses the active pipeline to load crude into barges at the docking facility.

Pipeline excavation began at the Sunray Road location (Photo 5) and work stopped at 6:30 pm.

Thursday, June 15

Paul Supak, Casey Wills and Marlin Fuller held a safety meeting to discuss the planned activities for the day and the possible hazards that could be encountered.

An excavator was used to expose the pipelines at the Sunray Road location and PSC was on-site to remove groundwater from the excavation. After excavating and uncovering ten pipelines it was discovered that one of the 8-inch pipelines had already been cut and capped at this location.

The EPA RPM and a representative of the TCEQ witnessed activities.

After all the pipelines were exposed USA began drilling holes in the tops of the pipelines and worked stopped at 6:30 pm.

Friday, June 16

Paul Supak, Casey Wills and Marlin Fuller held a safety meeting to discuss the planned activities for the day and the possible hazards that could be encountered.

The excavator continued to expose the remainder of the pipelines and the holes were drilled into all the pipelines. Hydrocarbon vapors were detected at a concentration of 9.5 ppm and respirators were worn until vapors were no longer detected.

A pneumatic saw was used to cut sections out of each of the abandoned pipelines and the initial pipeline was pigged from Bishop Road to Sunray Road. The remainders of the pipelines were cut and sections of pipe were removed (Photos 6, 7 and 8).
Pigging of the pipelines was initiated and the site was secured at 6:30 when work stopped (Photo 9).

Saturday, June 17

Robert Lindsey (Kleinfelder), Casey Wills and Marlin Fuller held a safety meeting to discuss the planned activities for the day and the possible hazards that could be encountered. Specifically the topics discussed included heat, dehydration, hot work (cutting and welding) and PPE.

Prior to any cutting or welding, vapors were checked and all readings indicated a safe work environment in the excavation.

Pipeline pigging continued on the pipelines that were 8-inch or larger from Bishop Road to Sunray Road. The remainder of the contents of the pipelines was evacuated using a vacuum truck. The vacuum truck pulled fluids initially from the pipeline segments from Bishop Road to Sunray Road and then from Sunray Road to the former docking facility. The contents of all 10 pipelines were removed.

By 1:45 all the contents of the pipelines were evacuated from the segment between Bishop Road and Sunray Road and from Sunray road to the former barge dock facilities. PSC vacuum trucks recovered approximately 8,400 gallons of water and hydrocarbons during pigging and vacuum operations.

The following pipelines were detected in the excavation.

West to East on South (refinery) side of excavation:

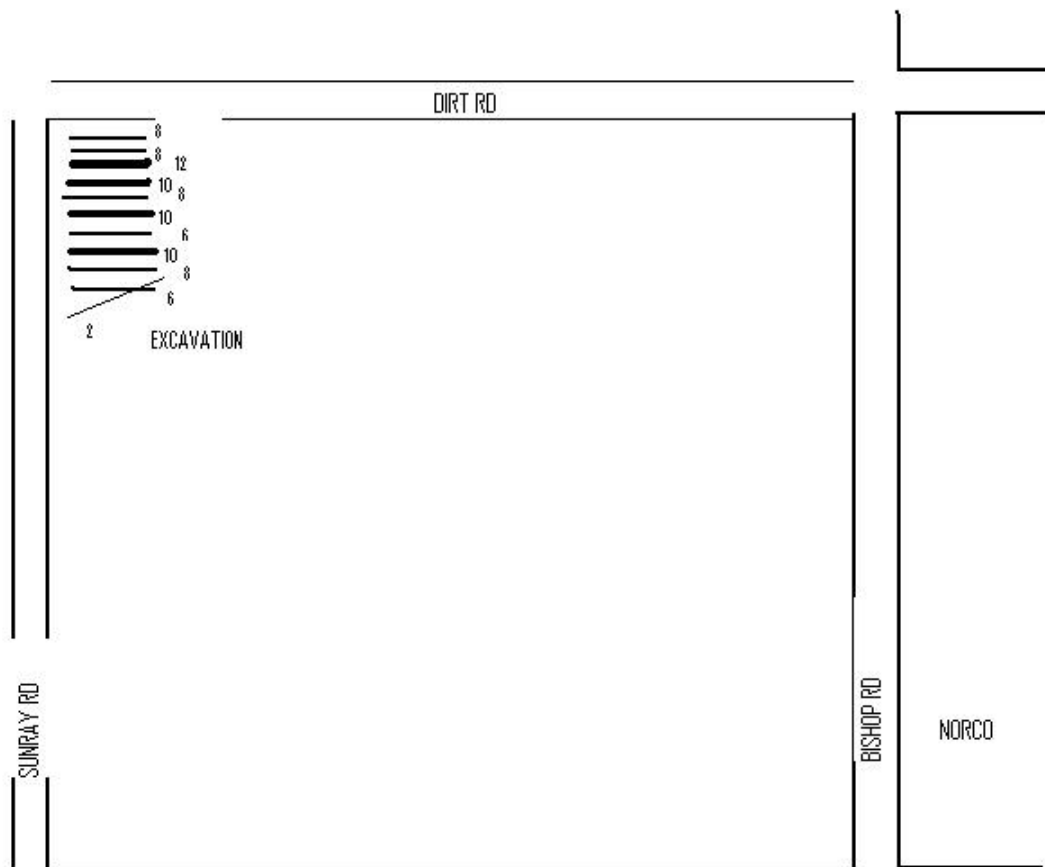
1. 6" – Black band capped
2. 8" – White PVC capped
3. 10" – Steel plate seal welded
4. 6" – Black band capped
5. 10" – Steel plate seal welded
6. 8" – White PVC capped
7. 10" – Steel plate seal welded
8. 12" – Steel plate seal welded
9. 8" – White PVC capped
10. 8" – White PVC capped

West to East on North (former and current barge dock) side of excavation:

1. 6" – Black band capped
2. Position 2 is vacant and should have lined up with the opposite 8". During the excavating, the 8" was found already cut and capped closer to the road. That section of pipe was removed.
3. 10" – Steel plate seal welded
4. 6" – Black band capped
5. 10" – Steel plate seal welded

6. 8" – White PVC capped
7. 10" – Steel plate seal welded
8. 12" – Steel plate seal welded
9. 8" – Steel plate seal welded
10. 8" – White PVC capped

The excavated pipelines are depicted on the following drawing.



All lines were completed and sealed off as shown in Photos 10 and 11. Some pipelines were in poor condition and would not accommodate welding. On those pipelines caps were placed prior to backfilling. Compaction and leveling of the site was completed at 7:00 pm.

Prior to abandoning the site all visually impacted liquids and soil were removed by the vacuum truck and soil samples were obtained from the excavation and analyzed for volatile organic compounds and semi-volatile compounds. The results of the analyses will be discussed later in this report.

Tuesday, June 20

Paul Supak, Casey Wills and Darren Dilliot (USA) held a safety meeting to discuss the planned activities for the day and the possible hazards that could be encountered.

USA welded steel caps onto the ends of the three 8" pipelines in the concrete containment at Bishop Rd. and onto the ends of the 12" pipe, the 10" pipe, and the 6" pipe below the pipe rack at Bishop Rd. The remaining five pipelines (two 10", two 8", and a 6") were filled with concrete rather than having welded caps because the pipes were too corroded to be welded (Photo 12). USA began to weld flanges onto the ends of the pipes on the pipe rack.

The site was secured prior to work stoppage for the day at 6:30 pm.

Wednesday, June 21

Paul Supak, Casey Wills and Darren Dilliot (USA) held a safety meeting to discuss the planned activities for the day and the possible hazards that could be encountered.

The remaining pipelines at the Bishop Road location had flanges welded onto the pipelines and then caps were bolted on the flanges.

Clean Out Summary

Described in this section is the specific clean out of each pipeline and a corrected pipeline location description.

Project Summary

Ten out of service pipelines were cut and capped at the point that the pipelines go underground near the intersection of Bishop Road and Bay Avenue. Near the intersection of Sunray Road and Bay Avenue the ten pipelines were cut again, twice, and a section of pipe was removed from each pipeline. Caps were placed on the pipelines or steel plates were welded on the ends of the pipelines after the pipelines were either pigged clean or a vacuum was placed on the pipeline to remove all the contents. In total approximately 8,400 gallons of hydrocarbons and water were removed from the pipelines and placed in Tank 26 on the refinery property.

As required by the EPA the contents of the pipelines were removed from the section of pipeline from Bishop Road to Sunray Road and from Sunray Road to the former barge dock facilities.

After any spilled liquid and impacted soil was removed from the excavation at Sunray Road two sediment samples were obtained for laboratory analysis of volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC). Results of the

analyses, which are in Appendix C, indicated several VOC were detected. However, only acetone and toluene were detected above the laboratory reporting limits.

The maximum value for acetone in the sediment was 73 ug/kg and the TCEQ Ecological Benchmark for acetone is 60,030 ug/kg for freshwater and 167,230 ug/kg for marine sediment. The maximum value for toluene was 6.6 ug/kg and the Ecological Benchmarks are 2,880 ug/kg and 940 ug/kg respectively.

The area of the abandoned pipelines will be further evaluated during the RI/FS.

After the pipeline clean out and abandonment NORCO hired Wendell and Associates to perform a Corrosion Mitigation Survey of the active 8-inch pipeline that connects the refinery to the current barge dock facility. A copy of the report is included in Appendix D.

Results of the survey included a detailed mapping of the location of the 8-inch pipeline, which is different from the location that NORCO was provided and has been reported in past documents. Included on Figures 1 and 2 are pipeline maps showing the correct pipeline location as determined by Wendel and from discussion with personnel with the TCEQ and the RRC. The survey also provided the names of three additional pipelines that cross the NORCO pipeline, which include two pipelines owned by Gulf South (Photo 13) and one owned by Boss Pipeline. In addition Plains Marketing owns a pipeline that runs through the wetlands adjacent to the refinery. All of the pipelines are shown on Figures 1 and 2.

NORCO is in the process of implementing the recommendations in the mitigation survey.

FIGURES



Legend			
<div><div></div>Roads</div>	<div><div></div>Active Pipeline</div>	<div><div></div>Abandoned Pipeline</div>	<div><div></div>Outside Operations</div>
<div><div></div>Area Descriptions</div>	<div><div></div>Above Ground</div>	<div><div></div>Above Ground</div>	<div><div></div>Gulf South Pipeline</div>
	<div><div></div>Underground</div>	<div><div></div>Underground</div>	<div><div></div>Boss Pipeline</div>
			<div><div></div>Gathering Line 2'</div>
			<div><div></div>Plains Marketing Pipeline</div>

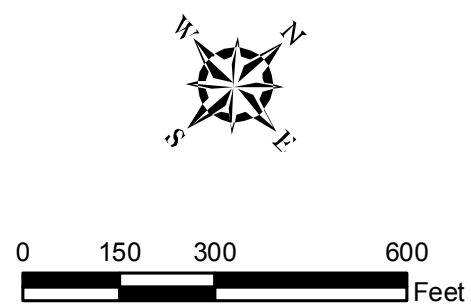
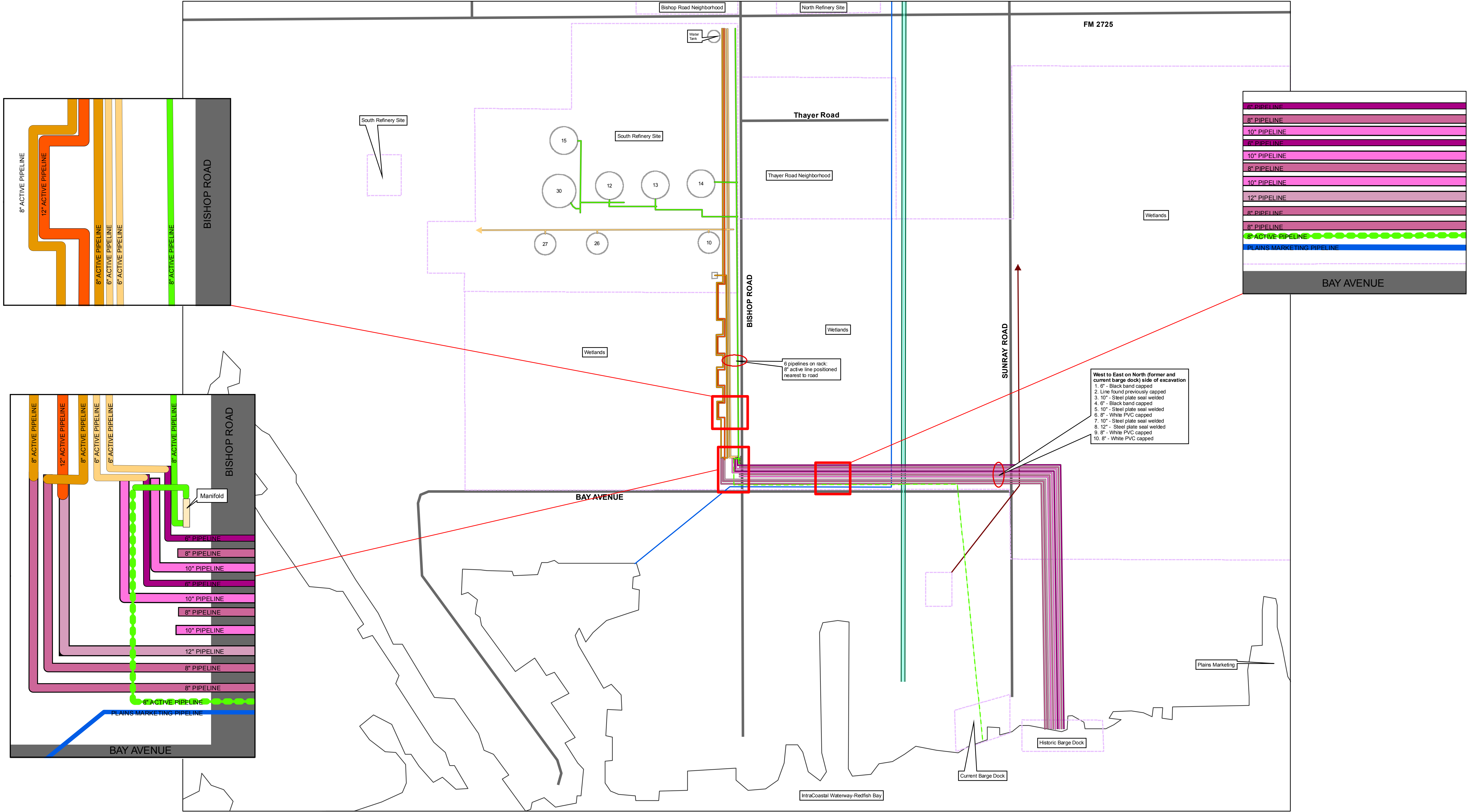


Figure 2	SITE MAP		<div><div></div><div>KLEINFELDER EXPECT MORE</div><div>1340 Charwood Road, Suite I • Hanover, MD 21076 • (866) 862-9760</div></div>	Drawn By: MAEA	
	Falcon Refinery Ingleside, San Patricio County, Texas			Revised By: SMO	
				Checked By:	
	Project No. 59752	Filename: Falcon Refinery w/ Photo. mxd		Date: 12/14/2006	Page: 57



PHOTOS



Photo 1: Above ground pipelines.

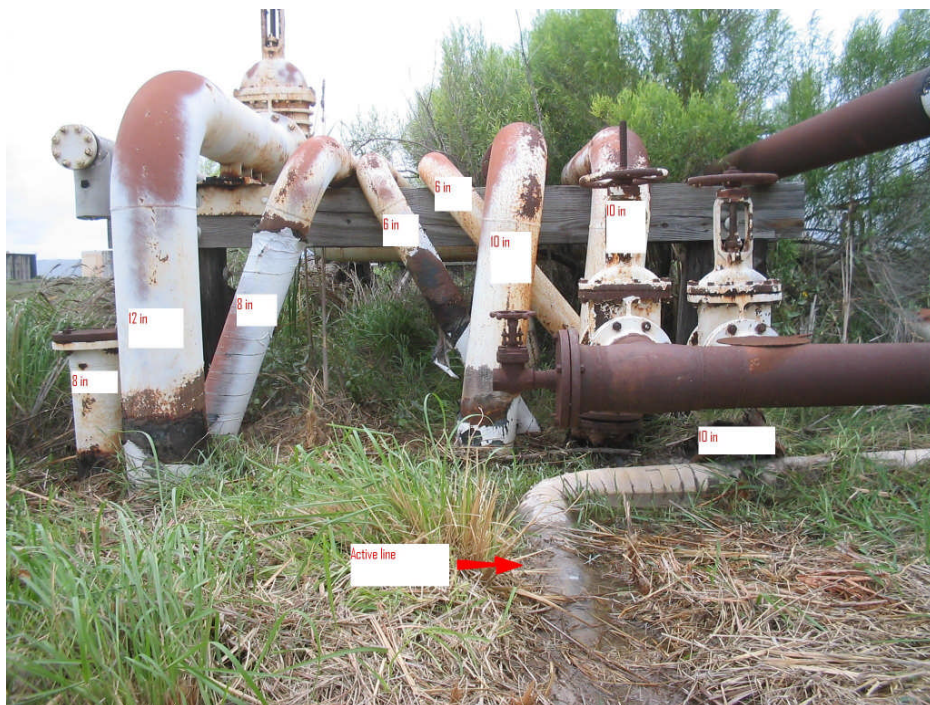


Photo 2: Diameters of pipelines that go underground at Bishop Road.



Photo 3: Concrete Containment.



Photo 4: Beginning Bishop Road Excavation.



Photo 5: Excavating begins at Sunray Road.



Photo 6: Pipelines were cut.



Photo 7: Water and Product are removed.



Photo 8: Sections of pipe were removed.



Photo 9: Set up for pigging.



Photo 10: Welding pipelines.



Photo 11: Welding caps on pipelines.



Photo 12: Concrete plugs.



Photo 13: Gulf South gas pipeline.

APPENDIX A

Introduction

In compliance with the approved Removal Action Work Plan for the Falcon Refinery Superfund Site, which is dated June 29, 2004, Kleinfelder provides this work plan addendum. Described in this addendum are the planned pipeline cleanout activities. USA Environmental, LP (USA) will perform the pipeline cleanout under the supervision of Kleinfelder.

The EPA On-Scene Coordinator (OSC) will be given five days notice of the pipeline cleanout.

Pipeline Background

There are seven pipelines that connect the Falcon Refinery to the current and former barge docking facilities (Figure 1). Six of the pipelines are abandoned and consist of a 10-inch, three 8-inch and two 6-inch diameter pipelines (Photograph 1). An active 8-inch pipeline (marked with a red spot in Photo 1), that lies immediately adjacent to the abandoned pipelines, will remain active.

The six abandoned pipelines will be exposed, any contents removed and plates will be welded on pipeline to ensure that there is no future environmental concern associated with the abandoned pipelines.

Safety and Health

The approved Site-Specific Health and Safety Plan will be provided to USA and prior to each day's activities a safety tailgate meeting will be held. Safety equipment will include hard hats, steel toe boots, gloves, safety glasses, an explosive meter, photoionization detector, fire extinguisher, absorbent material, oil booms and a first aid kit. Paul Supak (Kleinfelder) will be the designated Site Safety Officer for the pipeline activities.

Any excavations deeper than four feet will require shoring and the work area will be fenced or taped off. If vapors above the permissible exposure limit are detected, then appropriate respiratory protection will be used.

Prior to any excavating or probing utilities will be marked and pipelines will be located.

Pipeline Cleanout Activities

To minimize the potential for any impacts associated with the pipeline cleanout, block valves will be located and closed as near to the point where the pipelines go underground as possible, near Bishop Road. A vacuum truck will be on stand-by should the above ground portions of the pipelines contain any product.

A hole will be drilled in the top of each pipeline to determine if any liquid is detected in the pipelines. If liquid is detected, care will be taken to ensure that none is released. After the removal of any liquid, the pipelines will be cut at the surface with a pneumatic saw and the pipeline will be checked for vapors.

After a pipeline is cut, a Neoprene mechanical plug will be inserted in the end of each pipe and a slip on flange will be welded on the pipe. Blind flanges will then be bolted on the slip on flanges.

The area immediately adjacent to the point where the pipelines go below Sunray Road (Photo 2) will be excavated, the pipelines will be exposed and a trench box will be placed around the pipelines if groundwater or surface water are a concern. Currently there are nine pipeline markers at this location, indicating that two pipelines not associated with the Falcon Refinery are in this pipe chase.

A current will be attached to the pipelines at the Bishop Road location and readings will be made at the Sunray Road location to identify each pipeline.

A blind pig will be placed in the pipelines and the pipelines will then be vacuumed to remove any residual product that may be left in the abandoned pipelines. Any recovered fluid will be transported to the refinery and placed in Tank 2 on the North side of the refinery.

After the removal of any liquid, the pipelines at the Sunray Road location will be cut with a pneumatic saw. A vacuum truck will be on stand-by should any liquids be detected. After all fluids are removed, the pipelines at the Sunray Road location will have caps welded on the ends of each pipeline.

Removed soil will be placed back in the excavations and carefully compacted.

Site photographs will be taken and the OSC will be notified of any releases from the pipeline activity.

Cleanout Contingency

If any fluid is spilled, visually contaminated soil is observed or if significant organic vapors are detected, soil sampling will be performed for volatile and semi-volatile organics. If any spill reaches surface water then surface water sampling for volatile and semi-volatile organics will be performed.

Any impacted soil will be excavated and brought to the refinery where the soil will be placed on a 40 mil HDPE liner and covered with the liner material pending characterization and proper disposal.

Reporting

After the completion of pipeline cleanout activities a report will be prepared and sent to the OSC. The report will also be included in the final report, which will be submitted within 90 days of the completion of Removal Action activities.

FALCON PIPELINE EXCAVATION PROJECT
BISHOP ROAD
INGLESIDE, TEXAS
PIPELINE CLEANOUT



FIGURE 1



Photo 1



Photo 2

APPENDIX B

I am approving your proposal for the pipeline cleanouts on the condition that the lines are cleaned out from where they go underground all the way through the location of the old historic dock. From what you have told me, NORCO and/or the historical owners of the refinery had 7 pipelines that travelled parallel to Bay Road from approximately Bishop Road underneath Sunray Road and towards an old historical dock use by the refinery. It is also my understanding that one of the seven is an active line (used currently by Superior Crude) from the refinery that was tapped and redirected to the new existing dock. It is the expectation of EPA that all of the abandoned lines or portions thereof be cleaned out all the way to the old historic dock including the abandoned portion of the line that was tapped for the active line. Therefore, you may need to make a slight modification to your proposal.

On another issue, EPA would like you to identify the owners of all of the pipelines that run along Bay Road between Bishop Road and Sunray Road and Sunray Road to the old dock and Bay road to the new dock. This identification should be in the form of a photo/diagram which identifies the location of the pipelines, where they run, and who owns them.

APPENDIX C

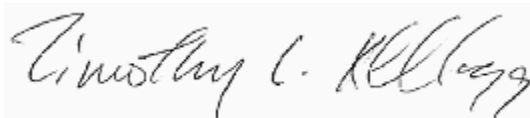
ANALYTICAL REPORT

Job Number: 560-950-1

Job Description: Falcon Refinery

For:
Kleinfelder Inc
3601 Manor Road
Austin, TX 78723

Attention: Mr. Steve Halasz



Timothy L. Kellogg
Project Manager II
tkellogg@stl-inc.com
07/27/2006

Project Manager: Timothy L. Kellogg

The test results entered in this report meet all NELAC requirements for accredited parameters. Any exceptions to NELAC requirements are noted in the report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. STL Corpus Christi Certifications and Approvals: NELAC TX T104704210-06-TX, NELAC KS E-10362, NELAC LA 03034, Oklahoma 9968, USDA Soil Permit S-42935 Revised.

Case Narrative for job: 560-J950-1

Client: Kleinfelder Inc

Date: 07/26/2006

Volatile Organics Analysis (EPA 8260)

It was noted during the analysis that the matrix spike recoveries on STL Corpus Christi job number 560-950 were outside of the normal laboratory acceptance criteria. All of the other associated quality control was acceptable.

EXECUTIVE SUMMARY - Detections

Client: Kleinfelder Inc

Job Number: 560-950-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
560-950-1	SR - EAST SAND 4.5'-5'					
Methylene Chloride		5.3	J B	20	ug/Kg	8260B
Acetone		73	B	20	ug/Kg	8260B
Methyl tert-butyl ether		0.45	J	5.0	ug/Kg	8260B
Toluene		3.9	J	5.0	ug/Kg	8260B
1,3,5-Trimethylbenzene		0.77	J	5.0	ug/Kg	8260B
1,2,4-Trimethylbenzene		0.41	J	5.0	ug/Kg	8260B
Methyl Ethyl Ketone		6.5	J	10	ug/Kg	8260B
Xylenes, Total		1.8	J	15	ug/Kg	8260B
560-950-2	SR - WEST SAND 5'					
Methylene Chloride		4.4	J B	20	ug/Kg	8260B
Acetone		55	B	20	ug/Kg	8260B
Methyl tert-butyl ether		0.77	J	5.0	ug/Kg	8260B
Toluene		6.6		5.0	ug/Kg	8260B
Ethylbenzene		0.48	J	5.0	ug/Kg	8260B
1,3,5-Trimethylbenzene		0.86	J	5.0	ug/Kg	8260B
1,2,4-Trimethylbenzene		1.4	J	5.0	ug/Kg	8260B
Methyl Ethyl Ketone		8.2	J	10	ug/Kg	8260B
Xylenes, Total		2.3	J	15	ug/Kg	8260B

METHOD SUMMARY

Client: Kleinfelder Inc

Job Number: 560-950-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Volatile Organic Compounds by GC/MS	STL-COR	SW846 8260B	
Purge and Trap for Solids	STL-COR		SW846 5030B
Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	STL-COR	SW846 8270C	
Ultrasonic Extraction	STL-COR		SW846 3550B

LAB REFERENCES:

STL-COR = STL-Corpus Christi

METHOD REFERENCES:

SW846 - "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986
And Its Updates.

METHOD / ANALYST SUMMARY

Client: Kleinfelder Inc

Job Number: 560-950-1

Method	Analyst	Analyst ID
SW846 8260B	Michalk, Kevin	KRM
SW846 8270C	Fisher, Gayland E	GEF

SAMPLE SUMMARY

Client: Kleinfelder Inc

Job Number: 560-950-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
560-950-1	SR - EAST SAND 4.5'-5'	Solid	06/26/2006 1025	06/26/2006 1233
560-950-2	SR - WEST SAND 5'	Solid	06/26/2006 1046	06/26/2006 1233

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-950-1

Client Sample ID: SR - EAST SAND 4.5'-5'

Lab Sample ID: 560-950-1

Date Sampled: 06/26/2006 1025

Client Matrix: Solid

Date Received: 06/26/2006 1233

8260B Volatile Organic Compounds by GC/MS

Method: 8260B

Analysis Batch: 560-2782

Instrument ID: Agilent GCMS [Method

Preparation: 5030B

Lab File ID: 06280606.D

Dilution: 1.0

Initial Weight/Volume: 5.01 g

Date Analyzed: 06/28/2006 1146

Final Weight/Volume: 5 mL

Date Prepared: 06/28/2006 1146

Analyte	DryWt Corrected: N	Result (ug/Kg)	Qualifier	MDL	RL
Dichlorodifluoromethane		ND		0.40	5.0
Chloromethane		ND		0.40	5.0
Vinyl chloride		ND		0.40	5.0
Bromomethane		ND		0.75	5.0
Chloroethane		ND		0.40	5.0
Trichlorofluoromethane		ND		0.40	5.0
Ethyl ether		ND		0.40	5.0
1,1-Dichloroethene		ND		0.40	5.0
Carbon disulfide		ND		0.40	5.0
Iodomethane		ND		0.40	5.0
Acrolein		ND		5.0	50
Methylene Chloride		5.3	J B	0.40	20
Acetone		73	B	1.4	20
trans-1,2-Dichloroethene		ND		0.40	5.0
Methyl tert-butyl ether		0.45	J	0.40	5.0
Acetonitrile		ND		5.0	50
1,1-Dichloroethane		ND		0.40	5.0
Acrylonitrile		ND		5.0	50
Vinyl acetate		ND		0.44	5.0
cis-1,2-Dichloroethene		ND		0.40	5.0
2,2-Dichloropropane		ND		0.40	5.0
Chloroform		ND		0.40	5.0
Ethyl acetate		ND		1.0	5.0
Carbon tetrachloride		ND		0.40	5.0
1,1,1-Trichloroethane		ND		0.40	5.0
1,1-Dichloropropene		ND		0.40	5.0
Benzene		ND		0.40	5.0
1,2-Dichloroethane		ND		0.40	5.0
Trichloroethene		ND		0.40	5.0
Dibromomethane		ND		0.40	5.0
1,2-Dichloropropane		ND		0.40	5.0
Dichlorobromomethane		ND		1.0	5.0
Methyl methacrylate		ND		0.40	5.0
1,4-Dioxane		ND		10	100
cis-1,3-Dichloropropene		ND		1.0	5.0
Toluene		3.9	J	0.40	5.0
2-Nitropropane		ND		1.0	5.0
methyl isobutyl ketone		ND		0.64	5.0
trans-1,3-Dichloropropene		ND		1.0	5.0
Tetrachloroethene		ND		0.40	5.0
Ethyl methacrylate		ND		1.0	5.0
1,1,2-Trichloroethane		ND		0.40	5.0
Chlorodibromomethane		ND		1.0	5.0

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-950-1

Client Sample ID: SR - EAST SAND 4.5'-5'

Lab Sample ID: 560-950-1

Date Sampled: 06/26/2006 1025

Client Matrix: Solid

Date Received: 06/26/2006 1233

8260B Volatile Organic Compounds by GC/MS

Method: 8260B

Analysis Batch: 560-2782

Instrument ID: Agilent GCMS [Method

Preparation: 5030B

Lab File ID: 06280606.D

Dilution: 1.0

Initial Weight/Volume: 5.01 g

Date Analyzed: 06/28/2006 1146

Final Weight/Volume: 5 mL

Date Prepared: 06/28/2006 1146

Analyte	DryWt Corrected: N	Result (ug/Kg)	Qualifier	MDL	RL
1,3-Dichloropropane		ND		0.40	5.0
Ethylene Dibromide		ND		0.40	5.0
2-Hexanone		ND		0.40	5.0
Chlorobenzene		ND		0.40	5.0
Ethylbenzene		ND		0.40	5.0
Bromoform		ND		1.0	5.0
Styrene		ND		1.0	5.0
1,1,2,2-Tetrachloroethane		ND		0.40	5.0
1,2,3-Trichloropropane		ND		0.40	5.0
1,3,5-Trimethylbenzene		0.77	J	0.40	5.0
1,2,4-Trimethylbenzene		0.41	J	0.40	5.0
1,2,3-Trichlorobenzene		ND		0.40	5.0
Methyl Ethyl Ketone		6.5	J	0.43	10
1,1,2-Trichloro-1,2,2-trifluoroethane		ND		0.40	5.0
Xylenes, Total		1.8	J	0.40	15
Surrogate		%Rec		Acceptance Limits	
Dibromofluoromethane (Surr)		88		50.0 - 126.0	
1,2-Dichloroethane-d4		93		67.0 - 120.0	
Toluene-d8		87		57.0 - 120.0	
4-Bromofluorobenzene (Surr)		87		44.0 - 126.0	

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-950-1

Client Sample ID: SR - WEST SAND 5'

Lab Sample ID: 560-950-2

Date Sampled: 06/26/2006 1046

Client Matrix: Solid

Date Received: 06/26/2006 1233

8260B Volatile Organic Compounds by GC/MS

Method: 8260B

Analysis Batch: 560-2782

Instrument ID: Agilent GCMS [Method

Preparation: 5030B

Lab File ID: 06280607.D

Dilution: 1.0

Initial Weight/Volume: 5.02 g

Date Analyzed: 06/28/2006 1212

Final Weight/Volume: 5 mL

Date Prepared: 06/28/2006 1212

Analyte	DryWt Corrected: N	Result (ug/Kg)	Qualifier	MDL	RL
Dichlorodifluoromethane		ND		0.40	5.0
Chloromethane		ND		0.40	5.0
Vinyl chloride		ND		0.40	5.0
Bromomethane		ND		0.75	5.0
Chloroethane		ND		0.40	5.0
Trichlorofluoromethane		ND		0.40	5.0
Ethyl ether		ND		0.40	5.0
1,1-Dichloroethene		ND		0.40	5.0
Carbon disulfide		ND		0.40	5.0
Iodomethane		ND		0.40	5.0
Acrolein		ND		5.0	50
Methylene Chloride		4.4	J B	0.40	20
Acetone		55	B	1.4	20
trans-1,2-Dichloroethene		ND		0.40	5.0
Methyl tert-butyl ether		0.77	J	0.40	5.0
Acetonitrile		ND		5.0	50
1,1-Dichloroethane		ND		0.40	5.0
Acrylonitrile		ND		5.0	50
Vinyl acetate		ND		0.44	5.0
cis-1,2-Dichloroethene		ND		0.40	5.0
2,2-Dichloropropane		ND		0.40	5.0
Chloroform		ND		0.40	5.0
Ethyl acetate		ND		1.0	5.0
Carbon tetrachloride		ND		0.40	5.0
1,1,1-Trichloroethane		ND		0.40	5.0
1,1-Dichloropropene		ND		0.40	5.0
Benzene		ND		0.40	5.0
1,2-Dichloroethane		ND		0.40	5.0
Trichloroethene		ND		0.40	5.0
Dibromomethane		ND		0.40	5.0
1,2-Dichloropropane		ND		0.40	5.0
Dichlorobromomethane		ND		1.0	5.0
Methyl methacrylate		ND		0.40	5.0
1,4-Dioxane		ND		10	100
cis-1,3-Dichloropropene		ND		1.0	5.0
Toluene		6.6		0.40	5.0
2-Nitropropane		ND		1.0	5.0
methyl isobutyl ketone		ND		0.64	5.0
trans-1,3-Dichloropropene		ND		1.0	5.0
Tetrachloroethene		ND		0.40	5.0
Ethyl methacrylate		ND		1.0	5.0
1,1,2-Trichloroethane		ND		0.40	5.0
Chlorodibromomethane		ND		1.0	5.0

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-950-1

Client Sample ID: SR - WEST SAND 5'

Lab Sample ID: 560-950-2

Date Sampled: 06/26/2006 1046

Client Matrix: Solid

Date Received: 06/26/2006 1233

8260B Volatile Organic Compounds by GC/MS

Method: 8260B

Analysis Batch: 560-2782

Instrument ID: Agilent GCMS [Method

Preparation: 5030B

Lab File ID: 06280607.D

Dilution: 1.0

Initial Weight/Volume: 5.02 g

Date Analyzed: 06/28/2006 1212

Final Weight/Volume: 5 mL

Date Prepared: 06/28/2006 1212

Analyte	DryWt Corrected: N	Result (ug/Kg)	Qualifier	MDL	RL
1,3-Dichloropropane		ND		0.40	5.0
Ethylene Dibromide		ND		0.40	5.0
2-Hexanone		ND		0.40	5.0
Chlorobenzene		ND		0.40	5.0
Ethylbenzene		0.48	J	0.40	5.0
Bromoform		ND		1.0	5.0
Styrene		ND		1.0	5.0
1,1,2,2-Tetrachloroethane		ND		0.40	5.0
1,2,3-Trichloropropane		ND		0.40	5.0
1,3,5-Trimethylbenzene		0.86	J	0.40	5.0
1,2,4-Trimethylbenzene		1.4	J	0.40	5.0
1,2,3-Trichlorobenzene		ND		0.40	5.0
Methyl Ethyl Ketone		8.2	J	0.43	10
1,1,2-Trichloro-1,2,2-trifluoroethane		ND		0.40	5.0
Xylenes, Total		2.3	J	0.40	15
Surrogate		%Rec		Acceptance Limits	
Dibromofluoromethane (Surr)		89		50.0 - 126.0	
1,2-Dichloroethane-d4		90		67.0 - 120.0	
Toluene-d8		86		57.0 - 120.0	
4-Bromofluorobenzene (Surr)		87		44.0 - 126.0	

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-950-1

Client Sample ID: SR - EAST SAND 4.5'-5'

Lab Sample ID: 560-950-1

Date Sampled: 06/26/2006 1025

Client Matrix: Solid

Date Received: 06/26/2006 1233

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C

Analysis Batch: 560-2899

Instrument ID: Agilent GCMS [Method

Preparation: 3550B

Prep Batch: 560-2843

Lab File ID: 06300622.D

Dilution: 1.0

Initial Weight/Volume: 30 g

Date Analyzed: 07/01/2006 0001

Final Weight/Volume: 1 mL

Date Prepared: 06/29/2006 0830

Injection Volume:

Analyte	DryWt Corrected: N	Result (ug/Kg)	Qualifier	MDL	RL
Phenol		ND		17	330
Bis(2-chloroethyl)ether		ND		37	330
2-Chlorophenol		ND		28	330
1,3-Dichlorobenzene		ND		44	330
1,4-Dichlorobenzene		ND		46	330
Benzyl alcohol		ND		25	330
1,2-Dichlorobenzene		ND		52	330
2-Methylphenol		ND		33	330
2,2'-oxybis(2-chloropropane)		ND		41	330
3 & 4 Methylphenol		ND		17	330
N-Nitrosodi-n-propylamine		ND		17	330
Hexachloroethane		ND		50	330
Nitrobenzene		ND		36	330
Isophorone		ND		17	330
2-Nitrophenol		ND		17	330
2,4-Dimethylphenol		ND		20	330
Bis(2-chloroethoxy)methane		ND		17	330
2,4-Dichlorophenol		ND		23	330
1,2,4-Trichlorobenzene		ND		46	330
Naphthalene		ND		42	330
4-Chloroaniline		ND		47	330
Hexachlorobutadiene		ND		45	330
4-Chloro-3-methylphenol		ND		17	330
2-Methylnaphthalene		ND		31	330
Hexachlorocyclopentadiene		ND		170	670
2,4,6-Trichlorophenol		ND		17	330
2,4,5-Trichlorophenol		ND		17	330
2-Chloronaphthalene		ND		17	330
2-Nitroaniline		ND		22	330
Dimethyl phthalate		ND		17	330
Acenaphthylene		ND		17	330
2,6-Dinitrotoluene		ND		17	330
3-Nitroaniline		ND		26	330
Acenaphthene		ND		17	330
2,4-Dinitrophenol		ND		330	1700
4-Nitrophenol		ND		330	1700
Dibenzofuran		ND		17	330
2,4-Dinitrotoluene		ND		170	330
Diethyl phthalate		ND		17	330
Fluorene		ND		17	330
4-Chlorophenyl phenyl ether		ND		170	330
4-Nitroaniline		ND		28	330
4,6-Dinitro-2-methylphenol		ND		170	1700

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-950-1

Client Sample ID: SR - EAST SAND 4.5'-5'

Lab Sample ID: 560-950-1

Date Sampled: 06/26/2006 1025

Client Matrix: Solid

Date Received: 06/26/2006 1233

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C	Analysis Batch: 560-2899	Instrument ID: Agilent GCMS [Method
Preparation: 3550B	Prep Batch: 560-2843	Lab File ID: 06300622.D
Dilution: 1.0		Initial Weight/Volume: 30 g
Date Analyzed: 07/01/2006 0001		Final Weight/Volume: 1 mL
Date Prepared: 06/29/2006 0830		Injection Volume:

Analyte	DryWt Corrected: N	Result (ug/Kg)	Qualifier	MDL	RL
N-Nitrosodiphenylamine		ND		17	330
4-Bromophenyl phenyl ether		ND		17	330
Hexachlorobenzene		ND		17	330
Phenanthrene		ND		17	330
Anthracene		ND		17	330
Di-n-butyl phthalate		ND		17	330
Fluoranthene		ND		17	330
Pyrene		ND		17	330
Butyl benzyl phthalate		ND		17	330
Benzo[a]anthracene		ND		17	330
Chrysene		ND		17	330
Bis(2-ethylhexyl) phthalate		ND	B	17	330
Di-n-octyl phthalate		ND		17	330
Benzo[b]fluoranthene		ND	B	17	330
Benzo[k]fluoranthene		ND	B	17	330
Benzo[a]pyrene		ND	B	17	330
Indeno[1,2,3-cd]pyrene		ND	B	17	330
Dibenz(a,h)anthracene		ND	B	17	330
Benzo[g,h,i]perylene		ND	B	17	330
3,3'-Dichlorobenzidine		ND		170	330
Pentachlorophenol		ND		25	1700
Surrogate		%Rec		Acceptance Limits	
2-Fluorophenol		74		45 - 120	
Phenol-d5		75		48 - 120	
Nitrobenzene-d5		73		47 - 120	
2-Fluorobiphenyl		78		50 - 120	
2,4,6-Tribromophenol		88		56 - 120	
Terphenyl-d14		88		56 - 120	

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-950-1

Client Sample ID: SR - WEST SAND 5'

Lab Sample ID: 560-950-2

Date Sampled: 06/26/2006 1046

Client Matrix: Solid

Date Received: 06/26/2006 1233

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 560-2899	Instrument ID:	Agilent GCMS [Method
Preparation:	3550B	Prep Batch: 560-2843	Lab File ID:	06300623.D
Dilution:	1.0		Initial Weight/Volume:	30 g
Date Analyzed:	07/01/2006 0029		Final Weight/Volume:	1 mL
Date Prepared:	06/29/2006 0830		Injection Volume:	

Analyte	DryWt Corrected: N	Result (ug/Kg)	Qualifier	MDL	RL
Phenol		ND		17	330
Bis(2-chloroethyl)ether		ND		37	330
2-Chlorophenol		ND		28	330
1,3-Dichlorobenzene		ND		44	330
1,4-Dichlorobenzene		ND		46	330
Benzyl alcohol		ND		25	330
1,2-Dichlorobenzene		ND		52	330
2-Methylphenol		ND		33	330
2,2'-oxybis(2-chloropropane)		ND		41	330
3 & 4 Methylphenol		ND		17	330
N-Nitrosodi-n-propylamine		ND		17	330
Hexachloroethane		ND		50	330
Nitrobenzene		ND		36	330
Isophorone		ND		17	330
2-Nitrophenol		ND		17	330
2,4-Dimethylphenol		ND		20	330
Bis(2-chloroethoxy)methane		ND		17	330
2,4-Dichlorophenol		ND		23	330
1,2,4-Trichlorobenzene		ND		46	330
Naphthalene		ND		42	330
4-Chloroaniline		ND		47	330
Hexachlorobutadiene		ND		45	330
4-Chloro-3-methylphenol		ND		17	330
2-Methylnaphthalene		ND		31	330
Hexachlorocyclopentadiene		ND		170	670
2,4,6-Trichlorophenol		ND		17	330
2,4,5-Trichlorophenol		ND		17	330
2-Chloronaphthalene		ND		17	330
2-Nitroaniline		ND		22	330
Dimethyl phthalate		ND		17	330
Acenaphthylene		ND		17	330
2,6-Dinitrotoluene		ND		17	330
3-Nitroaniline		ND		26	330
Acenaphthene		ND		17	330
2,4-Dinitrophenol		ND		330	1700
4-Nitrophenol		ND		330	1700
Dibenzofuran		ND		17	330
2,4-Dinitrotoluene		ND		170	330
Diethyl phthalate		ND		17	330
Fluorene		ND		17	330
4-Chlorophenyl phenyl ether		ND		170	330
4-Nitroaniline		ND		28	330
4,6-Dinitro-2-methylphenol		ND		170	1700

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-950-1

Client Sample ID: SR - WEST SAND 5'

Lab Sample ID: 560-950-2

Date Sampled: 06/26/2006 1046

Client Matrix: Solid

Date Received: 06/26/2006 1233

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch:	560-2899	Instrument ID:	Agilent GCMS [Method
Preparation:	3550B	Prep Batch:	560-2843	Lab File ID:	06300623.D
Dilution:	1.0			Initial Weight/Volume:	30 g
Date Analyzed:	07/01/2006 0029			Final Weight/Volume:	1 mL
Date Prepared:	06/29/2006 0830			Injection Volume:	

Analyte	DryWt Corrected: N	Result (ug/Kg)	Qualifier	MDL	RL
N-Nitrosodiphenylamine		ND		17	330
4-Bromophenyl phenyl ether		ND		17	330
Hexachlorobenzene		ND		17	330
Phenanthrene		ND		17	330
Anthracene		ND		17	330
Di-n-butyl phthalate		ND		17	330
Fluoranthene		ND		17	330
Pyrene		ND		17	330
Butyl benzyl phthalate		ND		17	330
Benzo[a]anthracene		ND		17	330
Chrysene		ND		17	330
Bis(2-ethylhexyl) phthalate		ND	B	17	330
Di-n-octyl phthalate		ND		17	330
Benzo[b]fluoranthene		ND	B	17	330
Benzo[k]fluoranthene		ND	B	17	330
Benzo[a]pyrene		ND	B	17	330
Indeno[1,2,3-cd]pyrene		ND	B	17	330
Dibenz(a,h)anthracene		ND	B	17	330
Benzo[g,h,i]perylene		ND	B	17	330
3,3'-Dichlorobenzidine		ND		170	330
Pentachlorophenol		ND		25	1700
Surrogate		%Rec		Acceptance Limits	
2-Fluorophenol		74		45 - 120	
Phenol-d5		74		48 - 120	
Nitrobenzene-d5		72		47 - 120	
2-Fluorobiphenyl		78		50 - 120	
2,4,6-Tribromophenol		91		56 - 120	
Terphenyl-d14		93		56 - 120	

DATA REPORTING QUALIFIERS

Client: Kleinfelder Inc

Job Number: 560-950-1

Lab Section	Qualifier	Description
GC/MS VOA		
	B	Compound was found in the blank and sample.
	F	MS or MSD exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
GC/MS Semi VOA		
	B	Compound was found in the blank and sample.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

QUALITY CONTROL RESULTS

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Method Blank - Batch: 560-2782

Method: 8260B

Preparation: 5030B

Lab Sample ID: MB 560-2782/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/28/2006 1120
Date Prepared: 06/28/2006 1120

Analysis Batch: 560-2782
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 8260
Lab File ID: 06280605.D
Initial Weight/Volume: 5.00 g
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Dichlorodifluoromethane	ND		0.40	5.0
Chloromethane	ND		0.40	5.0
Vinyl chloride	ND		0.40	5.0
Bromomethane	ND		0.75	5.0
Chloroethane	ND		0.40	5.0
Trichlorofluoromethane	ND		0.40	5.0
Ethyl ether	ND		0.40	5.0
1,1-Dichloroethene	ND		0.40	5.0
Carbon disulfide	ND		0.40	5.0
Iodomethane	ND		0.40	5.0
Acrolein	ND		5.0	50
Methylene Chloride	2.6	J	0.40	20
Acetone	10	J	1.4	20
trans-1,2-Dichloroethene	ND		0.40	5.0
Methyl tert-butyl ether	ND		0.40	5.0
Acetonitrile	ND		5.0	50
1,1-Dichloroethane	ND		0.40	5.0
Acrylonitrile	ND		5.0	50
Vinyl acetate	ND		0.44	5.0
cis-1,2-Dichloroethene	ND		0.40	5.0
2,2-Dichloropropane	ND		0.40	5.0
Chloroform	ND		0.40	5.0
Ethyl acetate	ND		1.0	5.0
Carbon tetrachloride	ND		0.40	5.0
1,1,1-Trichloroethane	ND		0.40	5.0
1,1-Dichloropropene	ND		0.40	5.0
Benzene	ND		0.40	5.0
1,2-Dichloroethane	ND		0.40	5.0
Trichloroethene	ND		0.40	5.0
Dibromomethane	ND		0.40	5.0
1,2-Dichloropropane	ND		0.40	5.0
Dichlorobromomethane	ND		1.0	5.0
Methyl methacrylate	ND		0.40	5.0
1,4-Dioxane	ND		10	100
cis-1,3-Dichloropropene	ND		1.0	5.0
Toluene	ND		0.40	5.0
2-Nitropropane	ND		1.0	5.0
methyl isobutyl ketone	ND		0.64	5.0
trans-1,3-Dichloropropene	ND		1.0	5.0
Tetrachloroethene	ND		0.40	5.0
Ethyl methacrylate	ND		1.0	5.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Method Blank - Batch: 560-2782

Lab Sample ID: MB 560-2782/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/28/2006 1120
Date Prepared: 06/28/2006 1120

Analysis Batch: 560-2782
Prep Batch: N/A
Units: ug/Kg

Method: 8260B Preparation: 5030B

Instrument ID: Agilent GCMS [Method 8260
Lab File ID: 06280605.D
Initial Weight/Volume: 5.00 g
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,2-Trichloroethane	ND		0.40	5.0
Chlorodibromomethane	ND		1.0	5.0
1,3-Dichloropropane	ND		0.40	5.0
Ethylene Dibromide	ND		0.40	5.0
2-Hexanone	ND		0.40	5.0
Chlorobenzene	ND		0.40	5.0
Ethylbenzene	ND		0.40	5.0
Bromoform	ND		1.0	5.0
Styrene	ND		1.0	5.0
1,1,2,2-Tetrachloroethane	ND		0.40	5.0
1,2,3-Trichloropropane	ND		0.40	5.0
1,3,5-Trimethylbenzene	ND		0.40	5.0
1,2,4-Trimethylbenzene	ND		0.40	5.0
1,2,3-Trichlorobenzene	ND		0.40	5.0
Methyl Ethyl Ketone	ND		0.43	10
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	5.0
Xylenes, Total	ND		0.40	15

Surrogate	% Rec	Acceptance Limits
Dibromofluoromethane (Surr)	102	50.0 - 126.0
1,2-Dichloroethane-d4	102	67.0 - 120.0
Toluene-d8	103	57.0 - 120.0
4-Bromofluorobenzene (Surr)	98	44.0 - 126.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Laboratory Control Sample - Batch: 560-2782

Method: 8260B

Preparation: 5030B

Lab Sample ID: LCS 560-2782/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/28/2006 1027
Date Prepared: 06/28/2006 1027

Analysis Batch: 560-2782
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 06280603.D
Initial Weight/Volume: 5.00 g
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Dichlorodifluoromethane	50.0	54.5	109	55.0 - 142.0	
Chloromethane	50.0	54.4	109	75.0 - 141.0	
Vinyl chloride	50.0	55.0	110	74.0 - 129.0	
Bromomethane	50.0	51.8	104	48.0 - 158.0	
Chloroethane	50.0	53.1	106	80.0 - 136.0	
Trichlorofluoromethane	50.0	58.1	116	67.0 - 140.0	
Ethyl ether	50.0	56.2	112	80.0 - 131.0	
1,1-Dichloroethene	50.0	53.5	107	76.0 - 127.0	
Carbon disulfide	50.0	55.1	110	54.0 - 135.0	
Iodomethane	50.0	55.2	110	58.0 - 136.0	
Acrolein	500	365	73	50.0 - 166.0	
Methylene Chloride	50.0	56.9	114	74.0 - 137.0	
Acetone	50.0	60.8	122	56.0 - 181.0	
trans-1,2-Dichloroethene	50.0	53.7	107	80.0 - 123.0	
Methyl tert-butyl ether	50.0	53.5	107	78.0 - 126.0	
Acetonitrile	500	525	105	60.0 - 151.0	
1,1-Dichloroethane	50.0	53.2	106	79.0 - 123.0	
Acrylonitrile	500	504	101	73.0 - 123.0	
Vinyl acetate	50.0	62.0	124	67.0 - 165.0	
cis-1,2-Dichloroethene	50.0	52.1	104	80.0 - 123.0	
2,2-Dichloropropane	50.0	51.8	104	71.0 - 136.0	
Chloroform	50.0	51.9	104	80.0 - 122.0	
Ethyl acetate	50.0	49.6	99	69.0 - 128.0	
Carbon tetrachloride	50.0	54.6	109	80.0 - 127.0	
1,1,1-Trichloroethane	50.0	52.9	106	80.0 - 124.0	
1,1-Dichloropropene	50.0	49.3	99	77.0 - 120.0	
Benzene	50.0	52.3	105	79.0 - 120.0	
1,2-Dichloroethane	50.0	49.5	99	78.0 - 124.0	
Trichloroethene	50.0	50.1	100	80.0 - 120.0	
Dibromomethane	50.0	50.8	102	80.0 - 122.0	
1,2-Dichloropropane	50.0	51.6	103	80.0 - 120.0	
Dichlorobromomethane	50.0	55.2	110	80.0 - 122.0	
Methyl methacrylate	50.0	51.8	104	75.0 - 132.0	
1,4-Dioxane	1000	1010	101	77.0 - 135.0	
cis-1,3-Dichloropropene	50.0	44.8	90	77.0 - 120.0	
Toluene	50.0	51.6	103	80.0 - 122.0	
2-Nitropropane	50.0	53.7	107	44.0 - 132.0	
methyl isobutyl ketone	50.0	49.3	99	73.0 - 127.0	
trans-1,3-Dichloropropene	50.0	57.3	115	77.0 - 131.0	
Tetrachloroethene	50.0	49.3	99	73.0 - 121.0	
Ethyl methacrylate	50.0	46.0	92	45.0 - 121.0	
1,1,2-Trichloroethane	50.0	51.5	103	80.0 - 122.0	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Laboratory Control Sample - Batch: 560-2782

Method: 8260B

Preparation: 5030B

Lab Sample ID: LCS 560-2782/1

Client Matrix: Solid

Dilution: 1.0

Date Analyzed: 06/28/2006 1027

Date Prepared: 06/28/2006 1027

Analysis Batch: 560-2782

Prep Batch: N/A

Units: ug/Kg

Instrument ID: Agilent GCMS [Method 8260B]

Lab File ID: 06280603.D

Initial Weight/Volume: 5.00 g

Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chlorodibromomethane	50.0	55.2	110	78.0 - 121.0	
1,3-Dichloropropane	50.0	51.9	104	80.0 - 122.0	
Ethylene Dibromide	50.0	51.7	103	80.0 - 122.0	
2-Hexanone	50.0	53.3	107	75.0 - 128.0	
Chlorobenzene	50.0	52.2	104	80.0 - 120.0	
Ethylbenzene	50.0	51.9	104	79.0 - 123.0	
Bromoform	50.0	48.8	98	64.0 - 120.0	
Styrene	50.0	54.4	109	75.0 - 128.0	
1,1,2,2-Tetrachloroethane	50.0	49.8	100	77.0 - 120.0	
1,2,3-Trichloropropane	50.0	55.8	112	77.0 - 122.0	
1,3,5-Trimethylbenzene	50.0	50.0	100	76.0 - 122.0	
1,2,4-Trimethylbenzene	50.0	50.7	101	76.0 - 122.0	
1,2,3-Trichlorobenzene	50.0	48.3	97	61.0 - 145.0	
Methyl Ethyl Ketone	50.0	51.2	102	70.0 - 135.0	
1,1,2-Trichloro-1,2,2-trifluoroethane	50.0	50.6	101	64.0 - 120.0	
Xylenes, Total	150	153	102	79.0 - 123.0	

Surrogate	% Rec	Acceptance Limits
Dibromofluoromethane (Surr)	106	50.0 - 126.0
1,2-Dichloroethane-d4	103	67.0 - 120.0
Toluene-d8	106	57.0 - 120.0
4-Bromofluorobenzene (Surr)	105	44.0 - 126.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 560-2782

Method: 8260B
Preparation: 5030B

MS Lab Sample ID: 560-950-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/28/2006 1318
Date Prepared: 06/28/2006 1318

Analysis Batch: 560-2782
Prep Batch: N/A

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 06280608.D
Initial Weight/Volume: 5.08 g
Final Weight/Volume: 5 mL

MSD Lab Sample ID: 560-950-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/28/2006 1344
Date Prepared: 06/28/2006 1344

Analysis Batch: 560-2782
Prep Batch: N/A

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 06280609.D
Initial Weight/Volume: 5.01 g
Final Weight/Volume: 5 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Dichlorodifluoromethane	101	77	10.0 - 144.0	25.6	30.0		
Chloromethane	106	91	10.0 - 169.0	13.6	30.0		
Vinyl chloride	103	91	10.0 - 171.0	11.0	30.0		
Bromomethane	97	84	10.0 - 150.0	13.8	30.0		
Chloroethane	99	85	10.0 - 168.0	14.0	30.0		
Trichlorofluoromethane	104	91	10.0 - 164.0	11.9	30.0		
Ethyl ether	104	103	10.0 - 150.0	0.2	30.0		
1,1-Dichloroethene	100	89	10.0 - 161.0	10.2	30.0		
Carbon disulfide	98	80	10.0 - 150.0	18.6	30.0		
Iodomethane	102	91	10.0 - 149.0	10	30.0		
Acrolein	49	44	10.0 - 191.0	10.8	30.0		
Methylene Chloride	100	93	10.0 - 150.0	5.4	30.0	B	B
Acetone	75	60	10.0 - 268.0	6.7	30.0	B	B
trans-1,2-Dichloroethene	100	91	10.0 - 150.0	7.6	30.0		
Methyl tert-butyl ether	98	97	51.0 - 140.0	0.5	30.0		
Acetonitrile	94	89	10.0 - 207.0	3.6	30.0		
1,1-Dichloroethane	99	92	10.0 - 164.0	6.0	30.0		
Acrylonitrile	89	88	10.0 - 150.0	1	30.0		
Vinyl acetate	28	10	10.0 - 150.0	92.3	30.0		F
cis-1,2-Dichloroethene	97	91	10.0 - 150.0	4.9	30.0		
2,2-Dichloropropane	91	87	10.0 - 165.0	3.1	30.0		
Chloroform	96	90	10.0 - 163.0	4.6	30.0		
Ethyl acetate	58	41	10.0 - 133.0	33.5	30.0		F
Carbon tetrachloride	95	87	10.0 - 150.0	7.8	30.0		
1,1,1-Trichloroethane	96	90	10.0 - 150.0	5.1	30.0		
1,1-Dichloropropene	91	86	10.0 - 144.0	4.9	30.0		
Benzene	97	93	64.0 - 129.0	2.8	30.0		
1,2-Dichloroethane	91	91	17.0 - 155.0	1.4	30.0		
Trichloroethene	93	91	10.0 - 150.0	0.9	30.0		
Dibromomethane	93	94	10.0 - 150.0	2.9	30.0		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 560-2782

Method: 8260B
Preparation: 5030B

MS Lab Sample ID: 560-950-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/28/2006 1318
Date Prepared: 06/28/2006 1318

Analysis Batch: 560-2782
Prep Batch: N/A

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 06280608.D
Initial Weight/Volume: 5.08 g
Final Weight/Volume: 5 mL

MSD Lab Sample ID: 560-950-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/28/2006 1344
Date Prepared: 06/28/2006 1344

Analysis Batch: 560-2782
Prep Batch: N/A

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 06280609.D
Initial Weight/Volume: 5.01 g
Final Weight/Volume: 5 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
1,2-Dichloropropane	97	95	10.0 - 150.0	0.7	30.0		
Dichlorobromomethane	101	98	10.0 - 150.0	1.2	30.0		
Methyl methacrylate	103	126	10.0 - 192.0	21.7	30.0		
1,4-Dioxane	87	91	10.0 - 236.0	5.9	30.0		
cis-1,3-Dichloropropene	80	79	10.0 - 149.0	1.1	30.0		
Toluene	91	88	64.0 - 126.0	2.0	30.0		
2-Nitropropane	84	88	10.0 - 166.0	6.6	30.0		
methyl isobutyl ketone	87	95	10.0 - 150.0	9.5	30.0		
trans-1,3-Dichloropropene	101	103	10.0 - 150.0	3.8	30.0		
Tetrachloroethene	94	97	10.0 - 173.0	4.4	30.0		
Ethyl methacrylate	69	59	10.0 - 150.0	13.7	30.0		
1,1,2-Trichloroethane	94	98	10.0 - 163.0	5.9	30.0		
Chlorodibromomethane	96	98	10.0 - 148.0	2.9	30.0		
1,3-Dichloropropane	93	96	10.0 - 150.0	4.4	30.0		
Ethylene Dibromide	94	95	10.0 - 156.0	2.9	30.0		
2-Hexanone	90	100	10.0 - 156.0	11.3	30.0		
Chlorobenzene	96	95	10.0 - 150.0	0.3	30.0		
Ethylbenzene	95	94	61.0 - 127.0	0.5	30.0		
Bromoform	79	81	10.0 - 158.0	3.5	30.0		
Styrene	98	98	10.0 - 152.0	0.9	30.0		
1,1,2,2-Tetrachloroethane	92	96	10.0 - 150.0	5.4	30.0		
1,2,3-Trichloropropane	106	109	10.0 - 170.0	3.8	30.0		
1,3,5-Trimethylbenzene	92	93	10.0 - 150.0	3.1	30.0		
1,2,4-Trimethylbenzene	93	93	10.0 - 149.0	1.3	30.0		
1,2,3-Trichlorobenzene	59	64	10.0 - 150.0	8.7	30.0		
Methyl Ethyl Ketone	85	86	10.0 - 167.0	2.4	30.0		
1,1,2-Trichloro-1,2,2-trifluoroethane	93	83	10.0 - 150.0	10.4	30.0		
Xylenes, Total	93	92	10.0 - 144.0	0.1	30.0		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
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Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
Dibromofluoromethane (Surr)	97	89	50.0 - 126.0
1,2-Dichloroethane-d4	92	91	67.0 - 120.0
Toluene-d8	97	93	57.0 - 120.0
4-Bromofluorobenzene (Surr)	94	89	44.0 - 126.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Matrix Spike/ Matrix Spike Duplicate Data Report - Batch: 560-2782

Method: 8260B
Preparation: 5030B

MS Lab Sample ID: 560-950-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/28/2006 1318
Date Prepared: 06/28/2006 1318

Units: ug/Kg

MSD Lab Sample ID: 560-950-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/28/2006 1344
Date Prepared: 06/28/2006 1344

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Dichlorodifluoromethane	0.0371	49.2	49.9	49.7	38.5
Chloromethane	0.113	49.2	49.9	52.1	45.4
Vinyl chloride	0.0293	49.2	49.9	50.5	45.2
Bromomethane	0.0580	49.2	49.9	47.9	41.7
Chloroethane	0.0293	49.2	49.9	48.6	42.2
Trichlorofluoromethane	0.0119	49.2	49.9	51.1	45.4
Ethyl ether	0.00635	49.2	49.9	51.2	51.3
1,1-Dichloroethene	0.0272	49.2	49.9	49.4	44.6
Carbon disulfide	0.207	49.2	49.9	48.4	40.1
Iodomethane	0.0151	49.2	49.9	50.2	45.5
Acrolein	0.0	492	499	243	218
Methylene Chloride	5.27 J	49.2	49.9	54.4 B	51.6 B
Acetone	72.9	49.2	49.9	110 B	103 B
trans-1,2-Dichloroethene	0.0224	49.2	49.9	49.0	45.5
Methyl tert-butyl ether	0.446 J	49.2	49.9	48.9	48.6
Acetonitrile	0.211	492	499	461	445
1,1-Dichloroethane	0.0122	49.2	49.9	48.5	45.7
Acrylonitrile	0.292	492	499	437	441
Vinyl acetate	0.0487	49.2	49.9	13.6	5.00 F
cis-1,2-Dichloroethene	0.00850	49.2	49.9	47.7	45.4
2,2-Dichloropropane	0.00705	49.2	49.9	45.0	43.6
Chloroform	0.0574	49.2	49.9	47.1	44.9
Ethyl acetate	0.205	49.2	49.9	28.6	20.4 F
Carbon tetrachloride	0.0	49.2	49.9	46.8	43.2
1,1,1-Trichloroethane	0.00860	49.2	49.9	47.1	44.8
1,1-Dichloropropene	0.0526	49.2	49.9	45.0	42.9
Benzene	0.0876	49.2	49.9	47.8	46.5
1,2-Dichloroethane	0.0124	49.2	49.9	44.7	45.3
Trichloroethene	0.207	49.2	49.9	45.8	45.4
Dibromomethane	0.00795	49.2	49.9	45.7	47.0
1,2-Dichloropropane	0.00459	49.2	49.9	47.7	47.3
Dichlorobromomethane	0.0	49.2	49.9	49.6	49.0
Methyl methacrylate	0.0	49.2	49.9	50.5	62.8
1,4-Dioxane	0.0	984	998	859	912
cis-1,3-Dichloropropene	0.00578	49.2	49.9	39.2	39.7
Toluene	3.89 J	49.2	49.9	48.6	47.6
2-Nitropropane	0.0	49.2	49.9	41.2	44.0
methyl isobutyl ketone	0.113	49.2	49.9	43.0	47.3
trans-1,3-Dichloropropene	0.0221	49.2	49.9	49.5	51.5

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Matrix Spike/ Matrix Spike Duplicate Data Report - Batch: 560-2782

Method: 8260B
Preparation: 5030B

MS Lab Sample ID: 560-950-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/28/2006 1318
Date Prepared: 06/28/2006 1318

Units: ug/Kg

MSD Lab Sample ID: 560-950-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/28/2006 1344
Date Prepared: 06/28/2006 1344

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Tetrachloroethene	0.0139	49.2	49.9	46.5	48.6
Ethyl methacrylate	0.137	49.2	49.9	33.7	29.4
1,1,2-Trichloroethane	0.0357	49.2	49.9	46.0	48.8
Chlorodibromomethane	0.00731	49.2	49.9	47.5	48.9
1,3-Dichloropropane	0.0154	49.2	49.9	46.0	48.1
Ethylene Dibromide	0.0451	49.2	49.9	46.2	47.6
2-Hexanone	0.137	49.2	49.9	44.5	49.8
Chlorobenzene	0.0186	49.2	49.9	47.2	47.3
Ethylbenzene	0.190	49.2	49.9	46.7	46.9
Bromoform	0.0133	49.2	49.9	39.0	40.4
Styrene	0.0333	49.2	49.9	48.3	48.8
1,1,2,2-Tetrachloroethane	0.0621	49.2	49.9	45.5	48.0
1,2,3-Trichloropropane	0.0324	49.2	49.9	52.3	54.3
1,3,5-Trimethylbenzene	0.766 J	49.2	49.9	45.9	47.4
1,2,4-Trimethylbenzene	0.411 J	49.2	49.9	46.0	46.6
1,2,3-Trichlorobenzene	0.0990	49.2	49.9	29.2	31.8
Methyl Ethyl Ketone	6.53 J	49.2	49.9	48.5	49.7
1,1,2-Trichloro-1,2,2-trifluoroethane	0.0116	49.2	49.9	45.8	41.3
Xylenes, Total	1.79 J	148	150	139	139

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Method Blank - Batch: 560-2843

Lab Sample ID: MB 560-2843/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/30/2006 1508
Date Prepared: 06/29/2006 0830

Analysis Batch: 560-2899
Prep Batch: 560-2843
Units: ug/Kg

Method: 8270C Preparation: 3550B

Instrument ID: Agilent GCMS [Method 8270
Lab File ID: 06300603.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Phenol	ND		17	330
Bis(2-chloroethyl)ether	ND		37	330
2-Chlorophenol	ND		28	330
1,3-Dichlorobenzene	ND		44	330
1,4-Dichlorobenzene	ND		46	330
Benzyl alcohol	ND		25	330
1,2-Dichlorobenzene	ND		52	330
2-Methylphenol	ND		33	330
2,2'-oxybis(2-chloropropane)	ND		41	330
3 & 4 Methylphenol	ND		17	330
N-Nitrosodi-n-propylamine	ND		17	330
Hexachloroethane	ND		50	330
Nitrobenzene	ND		36	330
Isophorone	ND		17	330
2-Nitrophenol	ND		17	330
2,4-Dimethylphenol	ND		20	330
Bis(2-chloroethoxy)methane	ND		17	330
2,4-Dichlorophenol	ND		23	330
1,2,4-Trichlorobenzene	ND		46	330
Naphthalene	ND		42	330
4-Chloroaniline	ND		47	330
Hexachlorobutadiene	ND		45	330
4-Chloro-3-methylphenol	ND		17	330
2-Methylnaphthalene	ND		31	330
Hexachlorocyclopentadiene	ND		170	670
2,4,6-Trichlorophenol	ND		17	330
2,4,5-Trichlorophenol	ND		17	330
2-Chloronaphthalene	ND		17	330
2-Nitroaniline	ND		22	330
Dimethyl phthalate	ND		17	330
Acenaphthylene	ND		17	330
2,6-Dinitrotoluene	ND		17	330
3-Nitroaniline	ND		26	330
Acenaphthene	ND		17	330
2,4-Dinitrophenol	ND		330	1700
4-Nitrophenol	ND		330	1700
Dibenzofuran	ND		17	330
2,4-Dinitrotoluene	ND		170	330
Diethyl phthalate	ND		17	330
Fluorene	ND		17	330
4-Chlorophenyl phenyl ether	ND		170	330

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Method Blank - Batch: 560-2843

Method: 8270C
Preparation: 3550B

Lab Sample ID: MB 560-2843/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/30/2006 1508
Date Prepared: 06/29/2006 0830

Analysis Batch: 560-2899
Prep Batch: 560-2843
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 8270
Lab File ID: 06300603.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
4-Nitroaniline	ND		28	330
4,6-Dinitro-2-methylphenol	ND		170	1700
N-Nitrosodiphenylamine	ND		17	330
4-Bromophenyl phenyl ether	ND		17	330
Hexachlorobenzene	ND		17	330
Phenanthrene	ND		17	330
Anthracene	ND		17	330
Di-n-butyl phthalate	ND		17	330
Fluoranthene	ND		17	330
Pyrene	ND		17	330
Butyl benzyl phthalate	ND		17	330
Benzo[a]anthracene	ND		17	330
Chrysene	ND		17	330
Bis(2-ethylhexyl) phthalate	28	J	17	330
Di-n-octyl phthalate	ND		17	330
Benzo[b]fluoranthene	23	J	17	330
Benzo[k]fluoranthene	29	J	17	330
Benzo[a]pyrene	27	J	17	330
Indeno[1,2,3-cd]pyrene	19	J	17	330
Dibenz(a,h)anthracene	20	J	17	330
Benzo[g,h,i]perylene	20	J	17	330
3,3'-Dichlorobenzidine	ND		170	330
Pentachlorophenol	ND		25	1700

Surrogate	% Rec	Acceptance Limits
2-Fluorophenol	79	45 - 120
Phenol-d5	79	48 - 120
Nitrobenzene-d5	78	47 - 120
2-Fluorobiphenyl	81	50 - 120
2,4,6-Tribromophenol	85	56 - 120
Terphenyl-d14	95	56 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Laboratory Control Sample - Batch: 560-2843

Method: 8270C

Preparation: 3550B

Lab Sample ID: LCS 560-2843/2-A

Client Matrix: Solid

Dilution: 1.0

Date Analyzed: 06/30/2006 1536

Date Prepared: 06/29/2006 0830

Analysis Batch: 560-2899

Prep Batch: 560-2843

Units: ug/Kg

Instrument ID: Agilent GCMS [Method 827

Lab File ID: 06300604.D

Initial Weight/Volume: 30 g

Final Weight/Volume: 1 mL

Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Phenol	3330	2550	76	55 - 120	
Bis(2-chloroethyl)ether	3330	2350	70	52 - 120	
2-Chlorophenol	3330	2510	75	54 - 120	
1,3-Dichlorobenzene	3330	2340	70	53 - 120	
1,4-Dichlorobenzene	3330	2370	71	54 - 120	
Benzyl alcohol	3330	2700	81	52 - 120	
1,2-Dichlorobenzene	3330	2340	70	53 - 120	
2-Methylphenol	3330	2560	77	56 - 120	
2,2'-oxybis(2-chloropropane)	3330	2340	70	52 - 120	
3 & 4 Methylphenol	6670	4810	72	49 - 120	
N-Nitrosodi-n-propylamine	3330	2240	67	49 - 120	
Hexachloroethane	3330	2280	69	53 - 120	
Nitrobenzene	3330	2450	73	54 - 120	
Isophorone	3330	2520	76	52 - 120	
2-Nitrophenol	3330	2520	76	53 - 120	
2,4-Dimethylphenol	3330	2650	79	68 - 120	
Bis(2-chloroethoxy)methane	3330	2560	77	55 - 120	
2,4-Dichlorophenol	3330	2600	78	57 - 120	
1,2,4-Trichlorobenzene	3330	2480	75	55 - 120	
Naphthalene	3330	2530	76	57 - 120	
4-Chloroaniline	3330	1710	51	22 - 120	
Hexachlorobutadiene	3330	2430	73	55 - 120	
4-Chloro-3-methylphenol	3330	2730	82	58 - 120	
2-Methylnaphthalene	3330	2510	75	55 - 120	
Hexachlorocyclopentadiene	3330	2300	69	44 - 120	
2,4,6-Trichlorophenol	3330	2730	82	56 - 120	
2,4,5-Trichlorophenol	3330	2760	83	58 - 120	
2-Chloronaphthalene	3330	2620	79	50 - 120	
2-Nitroaniline	3330	2770	83	56 - 120	
Dimethyl phthalate	3330	2800	84	58 - 120	
Acenaphthylene	3330	2730	82	58 - 120	
2,6-Dinitrotoluene	3330	2830	85	57 - 120	
3-Nitroaniline	3330	2330	70	33 - 120	
Acenaphthene	3330	2760	83	59 - 120	
2,4-Dinitrophenol	3330	2550	76	47 - 120	
4-Nitrophenol	3330	2660	80	59 - 124	
Dibenzofuran	3330	2700	81	56 - 120	
2,4-Dinitrotoluene	3330	2740	82	56 - 120	
Diethyl phthalate	3330	2800	84	60 - 120	
Fluorene	3330	2780	83	61 - 120	
4-Chlorophenyl phenyl ether	3330	2790	84	60 - 120	
4-Nitroaniline	3330	2810	84	55 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Laboratory Control Sample - Batch: 560-2843

Method: 8270C

Preparation: 3550B

Lab Sample ID: LCS 560-2843/2-A

Client Matrix: Solid

Dilution: 1.0

Date Analyzed: 06/30/2006 1536

Date Prepared: 06/29/2006 0830

Analysis Batch: 560-2899

Prep Batch: 560-2843

Units: ug/Kg

Instrument ID: Agilent GCMS [Method 827

Lab File ID: 06300604.D

Initial Weight/Volume: 30 g

Final Weight/Volume: 1 mL

Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
4,6-Dinitro-2-methylphenol	3330	2860	86	55 - 120	
N-Nitrosodiphenylamine	3330	2680	80	57 - 120	
4-Bromophenyl phenyl ether	3330	2930	88	60 - 120	
Hexachlorobenzene	3330	2900	87	61 - 120	
Phenanthrene	3330	2890	87	63 - 120	
Anthracene	3330	2860	86	63 - 120	
Di-n-butyl phthalate	3330	2880	86	63 - 120	
Fluoranthene	3330	2830	85	65 - 120	
Pyrene	3330	3050	92	63 - 120	
Butyl benzyl phthalate	3330	3000	90	64 - 120	
Benzo[a]anthracene	3330	3000	90	62 - 120	
Chrysene	3330	2970	89	65 - 120	
Bis(2-ethylhexyl) phthalate	3330	2980	89	66 - 120	
Di-n-octyl phthalate	3330	2990	90	65 - 120	
Benzo[b]fluoranthene	3330	3280	98	62 - 120	
Benzo[k]fluoranthene	3330	2770	83	52 - 120	
Benzo[a]pyrene	3330	3020	91	63 - 120	
Indeno[1,2,3-cd]pyrene	3330	3200	96	63 - 120	
Dibenz(a,h)anthracene	3330	3200	96	63 - 120	
Benzo[g,h,i]perylene	3330	3070	92	62 - 120	
3,3'-Dichlorobenzidine	3330	2930	88	34 - 120	
Pentachlorophenol	3330	2820	85	52 - 120	

Surrogate	% Rec	Acceptance Limits
2-Fluorophenol	77	45 - 120
Phenol-d5	77	48 - 120
Nitrobenzene-d5	76	47 - 120
2-Fluorobiphenyl	80	50 - 120
2,4,6-Tribromophenol	90	56 - 120
Terphenyl-d14	95	56 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 560-2843

Method: 8270C
Preparation: 3550B

MS Lab Sample ID: 560-936-B-6-E MS
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/30/2006 1604
Date Prepared: 06/29/2006 0830

Analysis Batch: 560-2899
Prep Batch: 560-2843

Instrument ID: Agilent GCMS [Method 827
Lab File ID: 06300605.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume:

MSD Lab Sample ID: 560-936-B-6-F MSD
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/30/2006 1632
Date Prepared: 06/29/2006 0830

Analysis Batch: 560-2899
Prep Batch: 560-2843

Instrument ID: Agilent GCMS [Method 827
Lab File ID: 06300606.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume:

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Phenol	74	82	48 - 120	10.8	30.0		
Bis(2-chloroethyl)ether	64	68	46 - 120	5.7	30.0		
2-Chlorophenol	69	77	48 - 120	11.4	30.0		
1,3-Dichlorobenzene	63	66	44 - 120	4.5	30.0		
1,4-Dichlorobenzene	64	67	44 - 120	5.4	30.0		
Benzyl alcohol	79	88	46 - 120	10.5	30.0		
1,2-Dichlorobenzene	63	67	45 - 120	6.9	30.0		
2-Methylphenol	76	84	52 - 120	10.6	30.0		
2,2'-oxybis(2-chloropropane)	62	67	47 - 120	6.5	30.0		
3 & 4 Methylphenol	74	80	48 - 120	8.1	30.0		
N-Nitrosodi-n-propylamine	63	69	40 - 120	9.0	30.0		
Hexachloroethane	61	66	10 - 150	7.2	30.0		
Nitrobenzene	66	74	39 - 120	11.4	30.0		
Isophorone	72	80	46 - 120	10.1	30.0		
2-Nitrophenol	71	84	46 - 120	15.8	30.0		
2,4-Dimethylphenol	79	85	59 - 125	7.6	30.0		
Bis(2-chloroethoxy)methane	70	79	47 - 120	12.6	30.0		
2,4-Dichlorophenol	80	88	53 - 120	10.4	30.0		
1,2,4-Trichlorobenzene	66	75	47 - 120	12.9	30.0		
Naphthalene	69	77	39 - 120	11.6	30.0		
4-Chloroaniline	50	55	26 - 120	9.5	30.0		
Hexachlorobutadiene	63	72	45 - 120	12.9	30.0		
4-Chloro-3-methylphenol	84	89	54 - 120	6.4	30.0		
2-Methylnaphthalene	72	80	10 - 150	10.3	30.0		
Hexachlorocyclopentadiene	65	67	10 - 120	1.8	30.0		
2,4,6-Trichlorophenol	83	88	53 - 120	6.5	30.0		
2,4,5-Trichlorophenol	84	87	59 - 120	4.4	30.0		
2-Chloronaphthalene	78	83	46 - 120	6.9	30.0		
2-Nitroaniline	83	85	55 - 120	2.2	30.0		
Dimethyl phthalate	83	86	54 - 120	4.3	30.0		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 560-2843

Method: 8270C
Preparation: 3550B

MS Lab Sample ID: 560-936-B-6-E MS
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/30/2006 1604
Date Prepared: 06/29/2006 0830

Analysis Batch: 560-2899
Prep Batch: 560-2843

Instrument ID: Agilent GCMS [Method 827
Lab File ID: 06300605.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume:

MSD Lab Sample ID: 560-936-B-6-F MSD
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/30/2006 1632
Date Prepared: 06/29/2006 0830

Analysis Batch: 560-2899
Prep Batch: 560-2843

Instrument ID: Agilent GCMS [Method 827
Lab File ID: 06300606.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume:

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Acenaphthylene	82	87	57 - 120	5.5	30.0		
2,6-Dinitrotoluene	85	90	53 - 120	6.1	30.0		
3-Nitroaniline	65	71	41 - 120	8.4	30.0		
Acenaphthene	82	86	57 - 120	5.6	30.0		
2,4-Dinitrophenol	89	101	18 - 120	13.1	30.0		
4-Nitrophenol	82	87	58 - 120	5.5	30.0		
Dibenzofuran	80	85	53 - 120	6.0	30.0		
2,4-Dinitrotoluene	84	87	52 - 120	3.5	30.0		
Diethyl phthalate	82	86	56 - 120	4.0	30.0		
Fluorene	82	87	59 - 120	6.1	30.0		
4-Chlorophenyl phenyl ether	82	87	54 - 120	5.8	30.0		
4-Nitroaniline	70	76	49 - 120	7.4	30.0		
4,6-Dinitro-2-methylphenol	93	101	48 - 120	9.0	30.0		
N-Nitrosodiphenylamine	78	81	38 - 125	4.4	30.0		
4-Bromophenyl phenyl ether	86	90	56 - 120	4.2	30.0		
Hexachlorobenzene	85	88	55 - 120	3.9	30.0		
Phenanthrene	85	88	44 - 125	3.1	30.0		
Anthracene	84	88	57 - 120	4.1	30.0		
Di-n-butyl phthalate	85	88	57 - 120	3.3	30.0		
Fluoranthene	84	87	44 - 131	3.5	30.0		
Pyrene	90	93	48 - 127	3.3	30.0		
Butyl benzyl phthalate	91	93	60 - 123	2.4	30.0		
Benzo[a]anthracene	88	91	56 - 120	3.0	30.0		
Chrysene	87	89	53 - 123	2.7	30.0		
Bis(2-ethylhexyl) phthalate	89	92	62 - 123	2.7	30.0		
Di-n-octyl phthalate	90	95	66 - 120	4.8	30.0		
Benzo[b]fluoranthene	90	92	63 - 120	2.5	30.0		
Benzo[k]fluoranthene	88	90	37 - 127	2.6	30.0		
Benzo[a]pyrene	89	91	51 - 122	3.1	30.0		
Indeno[1,2,3-cd]pyrene	94	97	58 - 120	3.3	30.0		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 560-2843

Method: 8270C
Preparation: 3550B

MS Lab Sample ID: 560-936-B-6-E MS
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/30/2006 1604
Date Prepared: 06/29/2006 0830

Analysis Batch: 560-2899
Prep Batch: 560-2843

Instrument ID: Agilent GCMS [Method 827
Lab File ID: 06300605.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume:

MSD Lab Sample ID: 560-936-B-6-F MSD
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/30/2006 1632
Date Prepared: 06/29/2006 0830

Analysis Batch: 560-2899
Prep Batch: 560-2843

Instrument ID: Agilent GCMS [Method 827
Lab File ID: 06300606.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume:

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Dibenz(a,h)anthracene	93	96	61 - 120	3.2	30.0		
Benzo[g,h,i]perylene	88	93	58 - 120	4.9	30.0		
3,3'-Dichlorobenzidine	39	47	31 - 120	19.9	30.0		
Pentachlorophenol	88	93	44 - 120	5.7	30.0		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
2-Fluorophenol	68	75	45 - 120
Phenol-d5	74	81	48 - 120
Nitrobenzene-d5	67	74	47 - 120
2-Fluorobiphenyl	78	83	50 - 120
2,4,6-Tribromophenol	88	92	56 - 120
Terphenyl-d14	92	95	56 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Matrix Spike/ Matrix Spike Duplicate Data Report - Batch: 560-2843

Method: 8270C
Preparation: 3550B

MS Lab Sample ID: 560-936-B-6-E MS
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/30/2006 1604
Date Prepared: 06/29/2006 0830

Units: ug/Kg

MSD Lab Sample ID: 560-936-B-6-F MSD
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/30/2006 1632
Date Prepared: 06/29/2006 0830

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Phenol	4.46	3330	3330	2460	2740
Bis(2-chloroethyl)ether	2.50	3330	3330	2140	2270
2-Chlorophenol	0.387	3330	3330	2300	2580
1,3-Dichlorobenzene	0.0	3330	3330	2100	2200
1,4-Dichlorobenzene	0.0	3330	3330	2120	2240
Benzyl alcohol	9.11	3330	3330	2630	2930
1,2-Dichlorobenzene	0.0	3330	3330	2090	2240
2-Methylphenol	6.37	3330	3330	2520	2800
2,2'-oxybis(2-chloropropane)	0.850	3330	3330	2080	2220
3 & 4 Methylphenol	1.76	6670	6670	4910	5320
N-Nitrosodi-n-propylamine	0.0	3330	3330	2110	2310
Hexachloroethane	0.0	3330	3330	2040	2200
Nitrobenzene	10.2	3330	3330	2190	2450
Isophorone	0.0	3330	3330	2400	2660
2-Nitrophenol	0.0	3330	3330	2380	2790
2,4-Dimethylphenol	0.727	3330	3330	2630	2840
Bis(2-chloroethoxy)methane	4.42	3330	3330	2320	2630
2,4-Dichlorophenol	0.0	3330	3330	2660	2950
1,2,4-Trichlorobenzene	0.0	3330	3330	2190	2500
Naphthalene	1.54	3330	3330	2300	2580
4-Chloroaniline	0.298	3330	3330	1660	1820
Hexachlorobutadiene	0.0	3330	3330	2110	2400
4-Chloro-3-methylphenol	1.99	3330	3330	2800	2980
2-Methylnaphthalene	0.748	3330	3330	2410	2670
Hexachlorocyclopentadiene	0.0	3330	3330	2180	2220
2,4,6-Trichlorophenol	0.0	3330	3330	2760	2950
2,4,5-Trichlorophenol	0.0	3330	3330	2790	2910
2-Chloronaphthalene	1.21	3330	3330	2580	2770
2-Nitroaniline	0.958	3330	3330	2780	2840
Dimethyl phthalate	0.0	3330	3330	2760	2880
Acenaphthylene	0.528	3330	3330	2730	2890
2,6-Dinitrotoluene	0.0	3330	3330	2830	3010
3-Nitroaniline	15.6	3330	3330	2170	2360
Acenaphthene	0.407	3330	3330	2720	2870
2,4-Dinitrophenol	0.0	3330	3330	2960	3380
4-Nitrophenol	1.02	3330	3330	2740	2900
Dibenzofuran	0.417	3330	3330	2670	2830
2,4-Dinitrotoluene	0.0	3330	3330	2790	2890
Diethyl phthalate	1.83	3330	3330	2750	2860

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Matrix Spike/ Matrix Spike Duplicate Data Report - Batch: 560-2843

Method: 8270C
Preparation: 3550B

MS Lab Sample ID: 560-936-B-6-E MS
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/30/2006 1604
Date Prepared: 06/29/2006 0830

Units: ug/Kg

MSD Lab Sample ID: 560-936-B-6-F MSD
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 06/30/2006 1632
Date Prepared: 06/29/2006 0830

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Fluorene	1.29	3330	3330	2720	2900
4-Chlorophenyl phenyl ether	2.98	3330	3330	2740	2910
4-Nitroaniline	1.19	3330	3330	2350	2530
4,6-Dinitro-2-methylphenol	0.0	3330	3330	3090	3380
N-Nitrosodiphenylamine	0.0	3330	3330	2590	2700
4-Bromophenyl phenyl ether	0.0	3330	3330	2880	3000
Hexachlorobenzene	0.0	3330	3330	2820	2940
Phenanthrene	1.64	3330	3330	2830	2920
Anthracene	0.795	3330	3330	2800	2920
Di-n-butyl phthalate	3.22	3330	3330	2820	2920
Fluoranthene	2.70	3330	3330	2790	2880
Pyrene	2.40	3330	3330	3000	3100
Butyl benzyl phthalate	8.68	3330	3330	3020	3100
Benzo[a]anthracene	4.70	3330	3330	2940	3030
Chrysene	2.13	3330	3330	2890	2970
Bis(2-ethylhexyl) phthalate	0.0	3330	3330	2980	3060
Di-n-octyl phthalate	5.17	3330	3330	3010	3160
Benzo[b]fluoranthene	7.96	3330	3330	3000	3080
Benzo[k]fluoranthene	7.84	3330	3330	2930	3010
Benzo[a]pyrene	3.11	3330	3330	2950	3050
Indeno[1,2,3-cd]pyrene	9.21	3330	3330	3130	3240
Dibenz(a,h)anthracene	8.13	3330	3330	3110	3210
Benzo[g,h,i]perylene	9.50	3330	3330	2950	3100
3,3'-Dichlorobenzidine	0.494	3330	3330	1290	1580
Pentachlorophenol	0.0	3330	3330	2940	3110

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Laboratory Chronicle

Client Samples:

Lab ID: 950-1 Client ID: SR - EAST SAND 4.5'-5'

Sample Date/Time: 06/26/2006 1025

Received Date/Time: 06/26/2006 1233

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Analyzed	Dilution	Lab	Analyst
A-8260B	560-950-B-1	1	560-2782		06/28/2006 1146	1.00	COR	KRM
P-3550B	560-950-A-1	1	560-2843		06/29/2006 0830	1.00	COR	LPM
A-8270C	560-950-A-1-A	1	560-2899	560-2843	07/01/2006 0001	1.00	COR	GEF

Lab ID: 950-1MS Client ID: SR - EAST SAND 4.5'-5'

Sample Date/Time: 06/26/2006 1025

Received Date/Time: 06/26/2006 1233

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Analyzed	Dilution	Lab	Analyst
A-8260B	560-950-B-1	1	560-2782		06/28/2006 1318	1.00	COR	KRM

Lab ID: 950-1MSD Client ID: SR - EAST SAND 4.5'-5'

Sample Date/Time: 06/26/2006 1025

Received Date/Time: 06/26/2006 1233

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Analyzed	Dilution	Lab	Analyst
A-8260B	560-950-B-1	1	560-2782		06/28/2006 1344	1.00	COR	KRM

Lab ID: 950-2 Client ID: SR - WEST SAND 5'

Sample Date/Time: 06/26/2006 1046

Received Date/Time: 06/26/2006 1233

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Analyzed	Dilution	Lab	Analyst
A-8260B	560-950-B-2	1	560-2782		06/28/2006 1212	1.00	COR	KRM
P-3550B	560-950-A-2	1	560-2843		06/29/2006 0830	1.00	COR	LPM
A-8270C	560-950-A-2-A	1	560-2899	560-2843	07/01/2006 0029	1.00	COR	GEF

Lab ID: 936-6 Client ID: SR - EAST SAND 4.5'-5'

Sample Date/Time: 06/26/2006 1025

Received Date/Time: 06/26/2006 1233

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Analyzed	Dilution	Lab	Analyst
A-8270C	560-936-B-6-D	1	560-2899	560-2843	06/30/2006 1728	1.00	COR	GEF

STL Corpus Christi

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-950-1

Laboratory Chronicle

Client Samples:

Lab ID: 936-6MS Client ID: SR - EAST SAND 4.5'-5'

Sample Date/Time: 06/26/2006 1025

Received Date/Time: 06/26/2006 1233

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Analyzed	Dilution	Lab	Analyst
A-8270C	560-936-B-6-E	1	560-2899	560-2843	06/30/2006 1604	1.00	COR	GEF

Lab ID: 936-6MSD Client ID: SR - EAST SAND 4.5'-5'

Sample Date/Time: 06/26/2006 1025

Received Date/Time: 06/26/2006 1233

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Analyzed	Dilution	Lab	Analyst
A-8270C	560-936-B-6-F	1	560-2899	560-2843	06/30/2006 1632	1.00	COR	GEF

Lab ID: MB Client ID: MB

Sample Date/Time: NA

Received Date/Time: NA

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Analyzed	Dilution	Lab	Analyst
A-8260B		1	560-2782		06/28/2006 1120	1.00	COR	KRM
A-8270C		1	560-2899	560-2843	06/30/2006 1508	1.00	COR	GEF

Lab ID: LCS Client ID: LCS

Sample Date/Time: NA

Received Date/Time: NA

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Analyzed	Dilution	Lab	Analyst
A-8260B		1	560-2782		06/28/2006 1027	1.00	COR	KRM
A-8270C		1	560-2899	560-2843	06/30/2006 1536	1.00	COR	GEF

18.0 on ice
just sampled

No. 007765

CHAIN OF CUSTODY RECORD

CUSTOMER INFORMATION		PROJECT INFORMATION					NUMBER OF CONTAINERS	ANALYSIS/METHOD REQUEST											REMARKS/PRECAUTIONS
COMPANY: Kleinfelder		PROJECT NAME/NUMBER: Falcon Refinery / 59752							BILLING INFORMATION										
SEND REPORT TO: Steve Halasz		BILL TO: Same																	
ADDRESS: 3601 Manor Rd. Austin, Tx 78723		ADDRESS:																	
PHONE: 512-926-6650		PHONE:															LAB JOB NO. 950		
FAX: 512-926-3312		FAX: PO NO.:																	
SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	CONTAINER	PRESERV.													
SR-East	sand - 4.5'-5'	6/26/06	10:25	Soil	4oz	ice	2	✓	✓										
SR-West	sand - 5'	6/26/06	10:46	Soil	4oz	↓	↓	✓	✓										
SAMPLER: Paul Supak		SHIPMENT METHOD:					AIRBILL NO.:												
REQUIRED TURNAROUND* <input type="checkbox"/> SAME DAY <input type="checkbox"/> 24 HOURS <input type="checkbox"/> 48 HOURS <input type="checkbox"/> 72 HOURS <input type="checkbox"/> 5 DAYS <input type="checkbox"/> 10 DAYS <input checked="" type="checkbox"/> ROUTINE <input type="checkbox"/> OTHER _____																			
1. RELINQUISHED BY:		DATE	2. RELINQUISHED BY:		DATE	3. RELINQUISHED BY:		DATE											
SIGNATURE: Paul Supak		11/6/06	SIGNATURE:			SIGNATURE:													
PRINTED NAME/COMPANY:		TIME 1:33	PRINTED NAME/COMPANY:		TIME	PRINTED NAME/COMPANY:		TIME											
1. RECEIVED BY:		DATE	2. RECEIVED BY:		DATE	3. RECEIVED BY:		DATE											
SIGNATURE: [Signature]		11/6/06	SIGNATURE:			SIGNATURE:													
PRINTED NAME/COMPANY:		TIME 1:33	PRINTED NAME/COMPANY:		TIME	PRINTED NAME/COMPANY:		TIME											

Page 37 of 38
*RUSH TURNAROUND MAY REQUIRE SURCHARGE

LOGIN SAMPLE RECEIPT CHECK LIST

Client: Kleinfelder Inc

Job Number: 560-950-1

Login Number: 950

Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	NA	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	NA	
Samples do not require splitting or compositing.	NA	

APPENDIX D



NATIONAL OIL RECOVERY CORPORATION

2006

ANNUAL

CORROSION MITIGATION SURVEY

8" LIQUIDE PIPELINE (CRUDE)

WAI JOB #090

JULY 12, 2006

WENDEL & ASSOCIATES, INC.

CORROSION SERVICES



July 12, 2006

National Oil Recovery Corporation
1472 FM 2725
Ingleside, Texas 78362

Re: **8" Liquide Pipeline (Crude)**
2006 Annual Corrosion Mitigation Survey
Job #090

The following report concerns the recently conducted Annual Corrosion Mitigation Survey of National Oil Recovery Corporation's **8" Liquide Pipeline (Crude)** system (Leased to Superior Crude Gathering) located in Ingleside, Texas. This survey was conducted in accordance with the Texas Railroad Commission's Pipeline Safety Regulations.

Wendel & Associates, Inc. is a twenty-six-year member of the National Association of Corrosion Engineers and is a member of the Contractors Safety Council. Wendel & Associates, Inc. Corrosion Service presently has a drug policy which meets or exceeds all Department of Transportation criteria and the Texas Railroad Commission's Pipeline Safety Regulations, 49 CFR § 199.1 - Drug Testing. Wendel & Associates, Inc. is Operator Qualified as required by 49 CFR § 192.801-809 and/or 49 CFR § 195.501-509.

INITIAL STATUS & GENERAL INFORMATION

The **8" Liquide Pipeline (Crude)** consists of approximately 2,200 feet of 8 5/8", Trident, .312 WT, API X42, and TGFIII coated and wrapped pipe extending from 8" Riser at Pig Trap (Dock Facility) to 8" Riser at Pig Trap (Pipe Rack) at CR 4714. The system is presently being protected by a sacrificial cathodic protection system.

SURVEY PROCEDURES

As referenced to a copper/copper sulfate electrode, pipe-to-soil potential readings were taken at pre-established locations throughout the facility. Dielectric fittings were checked for effectiveness. Sacrificial anode stations were read and evaluated. A visual inspection of the system was conducted and there were no signs of any surface leaks or abnormal conditions. Atmospheric corrosion is present. All pertinent data is recorded in the "Data" and "Recommendations" sections of this report.

During the course of the survey, IR drop was taken into consideration.



National Oil Recovery Corporation
8" Liquide Pipeline (Crude)
2006 Annual Corrosion Mitigation Survey
July 12, 2006
Page Two

SUMMARY OF DATA & DISCUSSION

As can be found in the "Data" section of this report, all referenced pipe-to-soil potential readings are above the -850 millivolt criteria established as an effective level of cathodic protection by the National Association of Corrosion Engineers.

RECOMMENDATIONS

The following recommendations are presented to ensure the system will continue to function in an effective and efficient manner:

1. It is recommended atmospheric corrosion be addressed in accordance with 49 CFR § 195.479 (see data & photos).
2. It is recommended damaged casing vents be repaired (see photo).
3. It is recommended damage test stations be repaired or replaced in accordance with 49 CFR § 195.469 (see data & photo).
4. It is recommended line markers be repaired (where damaged) and replaced to reflect the correct company contact information in accordance with 49 CFR § 195.707 (see photos).
5. It is recommended the right-of-way be addressed and maintained in accordance with 49 CFR § 195.705.
6. It is recommended the deterioration of pipeline coating be evaluated and addressed in accordance with 49 CFR § 195.459 (Damage Prevention).
7. It is recommended the system be re-surveyed on an annual basis by an experienced technician to ensure the desired results are being achieved.
8. It is recommended Wendel & Associates, Inc., Corrosion Services be contacted should any changes to this system occur as cathodic protection needs may change as well.



• Pipeline Patrol Report •

Company: National Oil Recovery Corporation
System: 8" Liquide Pipeline (Crude)
Date of Patrol: July 12, 2006
Type of Patrol: Vehicle/Foot (Vehicle / Foot / Boat / Aerial / Other)
Persons Involved: Allen M. Paizs

Description of 8" Riser @ Pig Trap (Dock Facility) to 8" Riser at
Patrol Point: Pig Trap (Pipe Rack) at CR 4714

Conditions Noted	•Yes•	•No•	Remarks
Atmospheric Corrosion?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>See data & photos</u>
Erosion Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Exposed Pipe?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>See photo</u>
Inadequate Signage?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Incorrect company information</u>
Inadequate Supports?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Gas Leaks?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Hazards Exist?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
ROW Condition Bad?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Needs to be addressed (see photo)</u>
Damages Noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>TL/Mag Station Damaged</u>

Remarks: 2006 Annual Corrosion Mitigation Survey

Signature: Allen M Paizs **Date:** July 12, 2006
Technician: Allen M. Paizs
O.Q. Certified

WENDEL & ASSOCIATES, INC.

Compliance Survey Report

NATIONAL OIL REC. CO; 090-001

Filters: 1. Survey = 2006 Annual Survey

Options: Include Survey Header Information

Surveyor: AMP

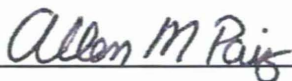
Oil Conditions: Damp

Meter: Fluke 73III

Reference: CSE

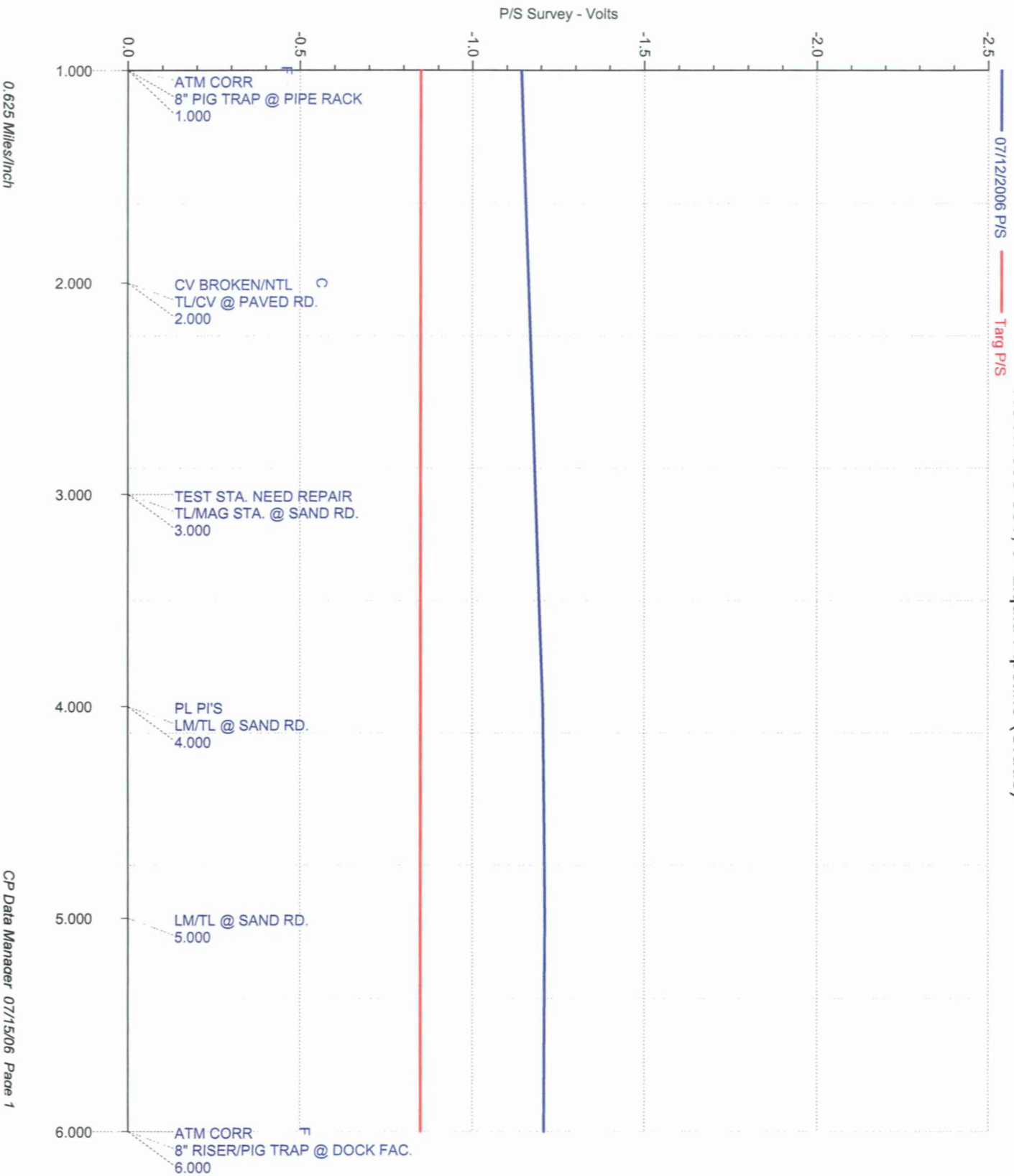
<u>Survey Date</u>	<u>Relative Milepost</u>	<u>Location</u>	<u>Structure P/S</u>	<u>Casing P/S</u>	<u>Casing Status</u>	<u>Foreign P/S</u>	<u>Insul Stat</u>	<u>Amps</u>	<u>Survey Remarks</u>
Company:									
Category: NATIONAL OIL REC.									
Row Code: 090-001			Row Name: 8" Liquid Pipeline (Crude)						
07/12/2006	1.000	8" PIG TRAP @ PIPE RACK	-1.143				-0.463 OK		ATM CORR
07/12/2006	2.000	TL/CV @ PAVED RD.		-0.565	OK				CV BROKEN/NTL
07/12/2006	3.000	TL/MAG STA. @ SAND RD.							TEST STA. NEED REPAIR
07/12/2006	4.000	LM/TL @ SAND RD.	-1.205						PL PIS
07/12/2006	5.000	LM/TL @ SAND RD.	-1.212						
07/12/2006	6.000	8" RISER/PIG TRAP @ DOCK FAC.	-1.208				-0.516 OK		ATM CORR

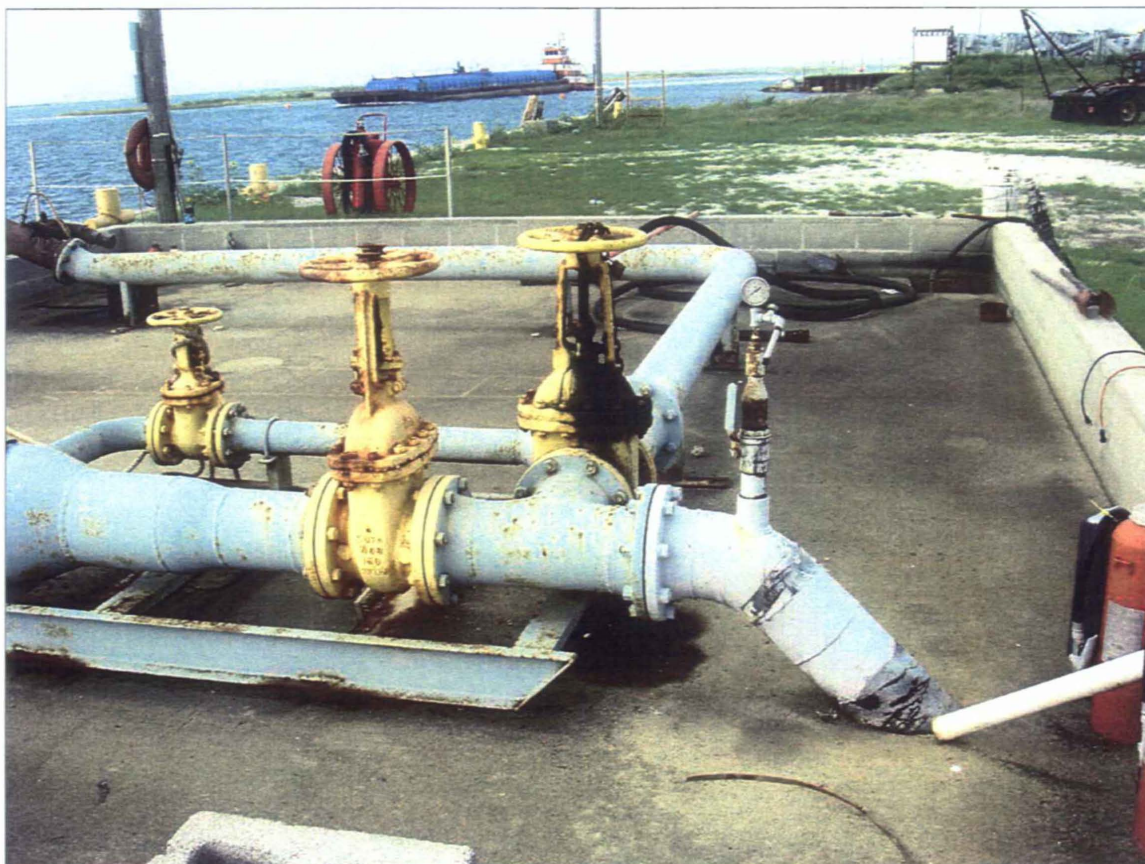
Surveyor



WENDEL & ASSOCIATES, INC.

ROW: 090-001; 8" Liquid Pipeline (Crude)





**NATIONAL OIL RECOVERY CORPORATION
8" LIQUIDS PL (CRUDE)
LEASED TO SUPERIOR CRUDE GATHERING
8" RISER @ PIGTRAP (DOCK FACILITY)
ATM CORROSION
7.12.2006**



**NATIONAL OIL RECOVERY CORPORATION
8" LIQUIDS PL (CRUDE)
LEASED TO SUPERIOR CRUDE GATHERING
8" RISER @ PIGTRAP (DOCK FACILITY)
ATM CORROSION @ RISER/CONCRETE
7.12.2006**



**NATIONAL OIL RECOVERY CORPORATION
8" LIQUIDS PL (CRUDE)
LEASED TO SUPERIOR CRUDE GATHERING
LM @ FNCL
INCORRECT COMPANY SIGNAGE
7.12.2006**



**NATIONAL OIL RECOVERY CORPORATION
8" LIQUIDS PL (CRUDE)
LEASED TO SUPERIOR CRUDE GATHERING
TL @ SAND RD.
ROW MAINT. NEEDED
7.12.2006**



**NATIONAL OIL RECOVERY CORPORATION
8" LIQUIDS PL (CRUDE)
LEASED TO SUPERIOR CRUDE GATHERING
TL/MAG STATION @ SAND RD.
TEST STATION DAMAGED
7.12.2006**



**NATIONAL OIL RECOVERY CORPORATION
8" LIQUIDS PL (CRUDE)
LEASED TO SUPERIOR CRUDE GATHERING
CV @ CR 4714 (BISHOP RD)
CASEING VENT & LINE MARKER DAMAGED
ROW MAINT. NEEDED
7.12.2006**



**NATIONAL OIL RECOVERY CORPORATION
8" LIQUIDS PL (CRUDE)
LEASED TO SUPERIOR CRUDE GATHERING
EXPOSED PL @ PIPE RACK (CR 4714)
7.12.2006**



**NATIONAL OIL RECOVERY CORPORATION
8" LIQUIDS PL (CRUDE)
LEASED TO SUPERIOR CRUDE GATHERING
8" RISER & PIGTRAP (CR 4714)
ATM CORROSION
7.12.2006**



**NATIONAL OIL RECOVERY CORPORATION
8" LIQUIDS PL (CRUDE)
LEASED TO SUPERIOR CRUDE GATHERING
RISERS & PIGTRAP (CR 4714)
DETERIORATION OF COATING
7.12.2006**

TN
MN (4.9°E)

[illegible]

1" = 216.7 ft



**8/6/07 REMOVAL ACTION WORKPLAN ADDENDUM
NO.2**

Introduction

On May 23, 2006, an addendum work plan was submitted to the EPA to perform pipeline clean out and abandonment activities, in compliance with the approved Removal Action Work Plan for the Falcon Refinery Superfund Site, which is dated June 29, 2004. After reviewing the work plan, the EPA On-Scene Coordinator (OSC) approved the plan with required changes. A map showing the locations of the initial pipeline cuts can be found in Figure 1. Pipeline details for the initial cut points, which were at point where the pipelines go underground near Bishop Avenue and adjacent to Sunray Road, are also provided on Figure 1. The results of the initial pipeline clean out activities were reported in Addendum No.1a, which was submitted on December 15, 2006.

The initial pipeline clean out included pigging and vacuuming the pipelines from near Bishop Avenue to the Sunray Road location. At the Sunray Road location, the pipelines were also vacuumed from Sunray Road to the former barge dock facility.

To complete the pipeline clean out, NORCO hired a contractor to locate and stake the exact location of the former barge dock facility and submitted a plan to ensure that all fluid was removed from the pipelines from Sunray Road to the former barge dock facility. This report describes the completion of the pipeline clean out.

During the second pipeline cleanout, the EPA, Kleinfelder and the contractor decided that the pipelines leading from the former barge dock were at a higher elevation than the area where the jetting of the pipelines (toward the wetland area) was performed and that any liquids present between the former dock and the jetting area would be retrieved at the excavation. The concurrence was that the lines leading from the former dock to the excavation area in the wetlands were adequately cleaned. These activities will be discussed in this report.

The EPA OSC was provided five days notice of the pipeline cleanout and abandonment.

Safety and Health

Prior to each day's activities, a safety tailgate meeting was held and the procedures outlined in the approved Safety and Health Plan were followed. On-site safety equipment for the pipeline clean out and abandonment included hard hats, steel toe boots, gloves, safety glasses, an explosive meter, photoionization detector (PID), fire extinguishers, absorbent material, oil booms and a first aid kit. Paul Supak (Kleinfelder) was the designated Site Safety Officer for the pipeline activities. All on site personnel had 40-hour HAZWOPER training and valid 8-hour refresher training. Personal protective equipment (PPE) also included organic vapor respirators.

No excavations extended deeper than four feet and as a result shoring was not required.

Pipeline Cleanout Activities

Under the supervision of Kleinfelder, USA Environmental, L.P. (USA) performed pipeline cleanout activities from May 7, 2007 to May 18, 2007.

USA (Casey Wills, Darren Billiot) arrived on site on May 7, 2007 and met with Paul Supak (Kleinfelder) who provided USA with the approved Site Specific Health and Safety Plan.

The following chronology of activities is provided.

Monday, May 7 and Tuesday May 8

Prior to the initiation of field activities, the on-site personnel, which included Paul Supak (Kleinfelder), Casey Wills (USA) and Darren Billiot (USA), held a site safety meeting and discussed the location and the telephone numbers of emergency services. Prior to mobilizing a line locator had been called and utilities in the area were marked. After the safety meeting, a thorough site reconnaissance was performed

USA began excavating at Area 1 (Figure 1) and only one pipeline was located in the excavation (Photo 1). A new location approximately 100 ft inland was selected and designated as Area 2. Again, only one line was located in the excavation. A third location was selected approximately 600 ft from area 2 and designated as Area 3. Ten pipelines were exposed at the Area 3 location (Photo 2).

Representatives of the EPA (Rafael Casanova), TCEQ (Phil Winsor), and USFW (Tammy Ash), who were present at the site, expressed their preference to excavate and perform the pipeline clean out in the wetlands at a location designated as Area 4 (Photo 3). This area was then excavated and 10 pipelines were located at a depth of approximately four feet. The pipelines consisted of one 12-inch, three 10-inch, four 8-inch and two 6-inch pipelines as shown in the pipeline detail for Area 4 on Figure 1.

Area 4 had been the location of a previous pipeline release and during excavating, hydrocarbon stained sediment and soil was evident (Photo 4). Excavation material was sampled on May 8, 2007 (EXC 1) and sent to STL for analysis (Appendix 1) of volatile organic compounds (VOC), semi-volatile compounds (SVOC) and total petroleum hydrocarbons (TPH). Several potential constituents of concern were detected.

Water from the wetlands seeped into the excavation and a vacuum truck was used to remove the water and hydrocarbons (Photo 5).

Several of the pipelines had circular saw holes already cut into them from a previous release investigation. The 12-inch pipeline had approximately a 4-foot section cut out, with plugs inserted into each end.

Prior to cutting any pipelines, holes were drilled into the tops of the pipelines that were not already cut to determine if liquid was present. A vacuum truck was on site to remove fluids that seeped into the excavation and fluid from the pipelines. All the pipelines lines were filled with water with the exception of first 10-inch pipeline (from the left as shown on the pipeline detail on Figure 1) the 12-inch, which was dry and the third 8-inch pipeline, which contained oil. Also prior to cutting, all lines were checked for explosive vapors and all levels were acceptable. USA cut six to eight foot sections out of each pipeline.

Wednesday May 9 and Wednesday May 18

Prior to the initiation of field activities, the on-site personnel, which included Paul Supak (Kleinfelder), Casey Wills (USA) and Darren Billiot (USA) and personnel from Shoreline Plumbing, held a site safety meeting and discussed the location and the telephone numbers of emergency services and thoroughly discussed project safety.

Pipeline cutting continued (Photo 6) on the morning of the 9th and the plan to insert a camera to inspect the contents of the pipelines was abandoned due to the poor conditions of the pipelines and oily waste. A conference was held at the site with the EPA and state trustees and the decision was made to jet out the contents of the pipelines with fresh water. Excavated soil that was dry was initially placed on plastic (Photo 7) and then transferred to a roll-off box (Photo 8) pending classification and disposal. Impacted soil and sediment were removed from the excavation pit and placed into a roll-off box.

On May 9th at 3:45 Shoreline Plumbing began water-jetting the pipelines (Photos 9 and 10) from the excavation area to the previous pipeline capping point near Sunray Rd. The distance was approximately 600 ft. The 8-inch pipeline, which contained oil, was cleaned three times and the 10-inch pipeline, which contained diesel, was cleaned twice and the remaining lines were cleaned on the first pass. EPA Remedial Project manager, Rafael Casanova, was on site during the water-jetting procedures and indicated satisfaction with the pipeline cleanout.

After the cleanout, foam plugs were inserted into the ends of each pipe and the ends were then filled with concrete (Photo 11).

After waste characterization and waste facility authorization, the wet soil and sediment were sent to US Ecology in Robstown and the dry soil to the El Centro landfill for disposal. Approximately 15 cubic yards went to each of the facilities on May 18th.

A sample from the excavation bottom was taken on May 11, 2007 (Floor 1) and the results, are provided in Appendix 2.

Project Completion

After all fluid and visually impacted soil and sediment were removed and verified with analytical results 85% of the excavation pit was backfilled with material provided by Offshore Specialty. The remaining 15% was filled with sand purchased from Coast Materials Inc. (2 truckloads).

All removed fluids were off-loaded into Tank 27 at the Falcon Refinery. The total removed fluid was approximately 27,000 gallons, which included water that seeped into the excavation, fluids from the pipelines and clean water provided by Offshore Specialty to jet the pipelines.

APPENDIX 1



ANALYTICAL REPORT

Job Number: 560-4594-1

Job Description: Falcon Refinery/59752

For:
Kleinfelder Inc
3601 Manor Road
Austin, TX 78723

Attention: Mr. Steve Halasz

Timothy L. Kellogg
Project Manager II
tkellogg@stl-inc.com
05/10/2007

Project Manager: Timothy L. Kellogg

The test results entered in this report meet all NELAC requirements for accredited parameters. Any exceptions to NELAC requirements are noted in the report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. STL Corpus Christi Certifications and Approvals: NELAC TX T104704210-06-TX, NELAC KS E-10362, NELAC LA 03034, Oklahoma 9968, USDA Soil Permit S-42935 Revised.

Severn Trent Laboratories, Inc.

STL Corpus Christi 1733 N. Padre Island Drive, Corpus Christi,
TX 78408

Tel (361) 289-2673 Fax (361) 289-2471 www.stl-inc.com Page 1 of 31



Volatile Organic Compounds (VOC) Analysis (EPA 8260B)

It was noted during the analysis that some of the matrix spike and matrix spike duplicate (MS/MSD) recoveries for STL Corpus Christi sample 560-4594-1 were outside of the normal laboratory acceptance criteria. It is suspected that the recoveries are due to matrix interferences inherent to the sample. All of the rest of the associated quality control for this analysis was acceptable.

EXECUTIVE SUMMARY - Detections

Client: Kleinfelder Inc

Job Number: 560-4594-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
560-4594-1	EXC 1 SAND					
Benzene		24		5.8	ug/Kg	8260B
Carbon disulfide		0.81	J	5.8	ug/Kg	8260B
Ethylbenzene		11		5.8	ug/Kg	8260B
Methyl Ethyl Ketone		2.0	J	12	ug/Kg	8260B
Toluene		2.4	J	5.8	ug/Kg	8260B
1,3,5-Trimethylbenzene		12		5.8	ug/Kg	8260B
1,2,4-Trimethylbenzene		38		5.8	ug/Kg	8260B
Xylenes, Total		23		17	ug/Kg	8260B
Benzo[a]anthracene		410		390	ug/Kg	8270C
Benzo[a]pyrene		300	J	390	ug/Kg	8270C
Benzo[b]fluoranthene		260	J	390	ug/Kg	8270C
Benzo[g,h,i]perylene		190	J	390	ug/Kg	8270C
Bis(2-ethylhexyl) phthalate		640		390	ug/Kg	8270C
Chrysene		990		390	ug/Kg	8270C
Dibenz(a,h)anthracene		64	J	390	ug/Kg	8270C
Di-n-octyl phthalate		180	J	390	ug/Kg	8270C
Fluoranthene		100	J	390	ug/Kg	8270C
Fluorene		96	J	390	ug/Kg	8270C
2-Methylnaphthalene		79	J	390	ug/Kg	8270C
Naphthalene		110	J	390	ug/Kg	8270C
Phenanthrene		300	J	390	ug/Kg	8270C
Pyrene		350	J	390	ug/Kg	8270C
>C12-C28		210		59	mg/Kg	TX 1005
>C28-C35		120		59	mg/Kg	TX 1005
Total Petroleum Hydrocarbons (C6-C35)		330		59	mg/Kg	TX 1005
Percent Moisture		15		0.010	%	PercentMoisture
Percent Solids		85		0.010	%	PercentMoisture

METHOD SUMMARY

Client: Kleinfelder Inc

Job Number: 560-4594-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Volatile Organic Compounds by GC/MS	STL CC	SW846 8260B	
Purge and Trap for Solids	STL CC		SW846 5030B
Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	STL CC	SW846 8270C	
Ultrasonic Extraction	STL CC		SW846 3550B
TPH by Texas 1005	STL CC	TCEQ TX 1005	
TPH by Texas 1005 Solid Prep	STL CC		TCEQ TX_1005_S_Prep
Percent Moisture	STL CC	EPA PercentMoisture	

LAB REFERENCES:

STL CC = STL Corpus Christi

METHOD REFERENCES:

EPA - US Environmental Protection Agency

SW846 - "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986
And Its Updates.

TCEQ - Texas Commission of Environmental Quality

METHOD / ANALYST SUMMARY

Client: Kleinfelder Inc

Job Number: 560-4594-1

Method	Analyst	Analyst ID
SW846 8260B	Newman, David	DN
SW846 8270C	Fisher, Gayland E	GEF
TCEQ TX 1005	Cady, Iryna M	IMC
EPA PercentMoisture	Henny, April	AH

SAMPLE SUMMARY

Client: Kleinfelder Inc

Job Number: 560-4594-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
560-4594-1	EXC 1 Sand	Solid	05/08/2007 0730	05/08/2007 0951

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-4594-1

Client Sample ID: EXC 1 Sand

Lab Sample ID: 560-4594-1

Client Matrix: Solid

% Moisture: 14.9

Date Sampled: 05/08/2007 0730

Date Received: 05/08/2007 0951

8260B Volatile Organic Compounds by GC/MS

Method: 8260B

Analysis Batch: 560-11285

Instrument ID: Agilent GCMS [Method

Preparation: 5030B

Lab File ID: 05090713.D

Dilution: 1.0

Initial Weight/Volume: 5.07 g

Date Analyzed: 05/09/2007 1515

Final Weight/Volume: 5 mL

Date Prepared: 05/09/2007 1515

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		ND		5.8	23
Acetonitrile		ND		5.8	58
Acrolein		ND		5.8	58
Acrylonitrile		ND		5.8	58
Benzene		24		0.58	5.8
Bromoform		ND		0.58	5.8
Bromomethane		ND		0.39	5.8
Carbon disulfide		0.81	J	0.35	5.8
Carbon tetrachloride		ND		0.58	5.8
Chlorobenzene		ND		0.58	5.8
Chlorodibromomethane		ND		0.58	5.8
Chloroethane		ND		0.58	5.8
Chloroform		ND		0.58	5.8
Chloromethane		ND		0.31	5.8
cis-1,2-Dichloroethene		ND		0.58	5.8
cis-1,3-Dichloropropene		ND		0.58	5.8
Dibromomethane		ND		0.58	5.8
Dichlorobromomethane		ND		0.58	5.8
Dichlorodifluoromethane		ND		0.58	5.8
1,1-Dichloroethane		ND		0.58	5.8
1,2-Dichloroethane		ND		0.58	5.8
1,1-Dichloroethene		ND		0.58	5.8
2,2-Dichloropropane		ND		0.58	5.8
1,2-Dichloropropane		ND		0.58	5.8
1,3-Dichloropropane		ND		0.58	5.8
1,1-Dichloropropene		ND		0.58	5.8
1,4-Dioxane		ND		11	120
Ethyl acetate		ND		0.39	5.8
Ethylbenzene		11		0.58	5.8
Ethylene Dibromide		ND		0.58	5.8
Ethyl ether		ND		0.58	5.8
Ethyl methacrylate		ND		0.58	5.8
2-Hexanone		ND		0.29	5.8
Iodomethane		ND		0.58	5.8
Methylene Chloride		ND		5.8	23
Methyl Ethyl Ketone		2.0	J	0.57	12
methyl isobutyl ketone		ND		0.58	5.8
Methyl methacrylate		ND		0.58	5.8
Methyl tert-butyl ether		ND		0.58	5.8
2-Nitropropane		ND		1.2	5.8
Styrene		ND		0.58	5.8
1,1,2,2-Tetrachloroethane		ND		0.58	5.8
Tetrachloroethene		ND		0.58	5.8

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-4594-1

Client Sample ID: EXC 1 Sand

Lab Sample ID: 560-4594-1

Client Matrix: Solid

% Moisture: 14.9

Date Sampled: 05/08/2007 0730

Date Received: 05/08/2007 0951

8260B Volatile Organic Compounds by GC/MS

Method: 8260B

Analysis Batch: 560-11285

Instrument ID: Agilent GCMS [Method

Preparation: 5030B

Lab File ID: 05090713.D

Dilution: 1.0

Initial Weight/Volume: 5.07 g

Date Analyzed: 05/09/2007 1515

Final Weight/Volume: 5 mL

Date Prepared: 05/09/2007 1515

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Toluene		2.4	J	0.58	5.8
trans-1,2-Dichloroethene		ND		0.58	5.8
trans-1,3-Dichloropropene		ND		0.58	5.8
1,2,3-Trichlorobenzene		ND		0.58	5.8
1,1,1-Trichloroethane		ND		0.58	5.8
1,1,2-Trichloroethane		ND		0.58	5.8
Trichloroethene		ND		0.58	5.8
Trichlorofluoromethane		ND		0.36	5.8
1,2,3-Trichloropropane		ND		0.58	5.8
1,1,2-Trichloro-1,2,2-trifluoroethane		ND		0.31	5.8
1,3,5-Trimethylbenzene		12		0.58	5.8
1,2,4-Trimethylbenzene		38		0.58	5.8
Vinyl acetate		ND		0.58	5.8
Vinyl chloride		ND		0.58	5.8
Xylenes, Total		23		1.7	17
Surrogate	%Rec	Acceptance Limits			
Dibromofluoromethane (Surr)	88	59 - 120			
1,2-Dichloroethane-d4 (Surr)	93	71 - 120			
Toluene-d8 (Surr)	78	57 - 120			
4-Bromofluorobenzene (Surr)	87	47 - 120			

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-4594-1

Client Sample ID: EXC 1 Sand

Lab Sample ID: 560-4594-1

Client Matrix: Solid

% Moisture: 14.9

Date Sampled: 05/08/2007 0730

Date Received: 05/08/2007 0951

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 560-11309	Instrument ID:	Agilent GCMS [Method
Preparation:	3550B	Prep Batch: 560-11283	Lab File ID:	05100711.D
Dilution:	1.0		Initial Weight/Volume:	30 g
Date Analyzed:	05/10/2007 1146		Final Weight/Volume:	1 mL
Date Prepared:	05/09/2007 0800		Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		ND		59	390
Acenaphthylene		ND		59	390
Anthracene		ND		59	390
Benzo[a]anthracene		410		59	390
Benzo[a]pyrene		300	J	59	390
Benzo[b]fluoranthene		260	J	59	390
Benzo[g,h,i]perylene		190	J	59	390
Benzo[k]fluoranthene		ND		59	390
Benzyl alcohol		ND		59	390
Bis(2-chloroethoxy)methane		ND		59	390
Bis(2-chloroethyl)ether		ND		44	390
Bis(2-ethylhexyl) phthalate		640		59	390
4-Bromophenyl phenyl ether		ND		59	390
Butyl benzyl phthalate		ND		59	390
4-Chloroaniline		ND		200	390
4-Chloro-3-methylphenol		ND		59	390
2-Chloronaphthalene		ND		59	390
2-Chlorophenol		ND		33	390
4-Chlorophenyl phenyl ether		ND		59	390
Chrysene		990		59	390
Dibenz(a,h)anthracene		64	J	59	390
Dibenzofuran		ND		59	390
1,3-Dichlorobenzene		ND		51	390
1,4-Dichlorobenzene		ND		54	390
1,2-Dichlorobenzene		ND		61	390
3,3'-Dichlorobenzidine		ND		200	390
2,4-Dichlorophenol		ND		59	390
Diethyl phthalate		ND		59	390
2,4-Dimethylphenol		ND		59	390
Dimethyl phthalate		ND		59	390
Di-n-butyl phthalate		ND		59	390
4,6-Dinitro-2-methylphenol		ND		200	2000
2,4-Dinitrophenol		ND		390	2000
2,6-Dinitrotoluene		ND		59	390
2,4-Dinitrotoluene		ND		200	390
Di-n-octyl phthalate		180	J	59	390
Fluoranthene		100	J	59	390
Fluorene		96	J	59	390
Hexachlorobenzene		ND		59	390
Hexachlorobutadiene		ND		53	390
Hexachlorocyclopentadiene		ND		78	790
Hexachloroethane		ND		59	390
Indeno[1,2,3-cd]pyrene		ND		59	390

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-4594-1

Client Sample ID: EXC 1 Sand

Lab Sample ID: 560-4594-1

Client Matrix: Solid

% Moisture: 14.9

Date Sampled: 05/08/2007 0730

Date Received: 05/08/2007 0951

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C	Analysis Batch: 560-11309	Instrument ID: Agilent GCMS [Method
Preparation: 3550B	Prep Batch: 560-11283	Lab File ID: 05100711.D
Dilution: 1.0		Initial Weight/Volume: 30 g
Date Analyzed: 05/10/2007 1146		Final Weight/Volume: 1 mL
Date Prepared: 05/09/2007 0800		Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Isophorone		ND		59	390
2-Methylnaphthalene		79	J	37	390
2-Methylphenol		ND		39	390
3 & 4 Methylphenol		ND		59	390
Naphthalene		110	J	49	390
2-Nitroaniline		ND		59	390
3-Nitroaniline		ND		200	390
4-Nitroaniline		ND		33	390
Nitrobenzene		ND		43	390
2-Nitrophenol		ND		59	390
4-Nitrophenol		ND		200	2000
N-Nitrosodi-n-propylamine		ND		59	390
N-Nitrosodiphenylamine		ND		59	390
2,2'-oxybis(2-chloropropane)		ND		48	390
Pentachlorophenol		ND		200	2000
Phenanthrene		300	J	59	390
Phenol		ND		59	390
Pyrene		350	J	59	390
1,2,4-Trichlorobenzene		ND		54	390
2,4,6-Trichlorophenol		ND		59	390
2,4,5-Trichlorophenol		ND		59	390

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	79	45 - 105
2-Fluorophenol	76	35 - 105
Nitrobenzene-d5	72	35 - 100
Phenol-d5	78	40 - 100
Terphenyl-d14	99	30 - 125
2,4,6-Tribromophenol	99	35 - 125

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-4594-1

Client Sample ID: EXC 1 Sand

Lab Sample ID: 560-4594-1

Client Matrix: Solid

% Moisture: 14.9

Date Sampled: 05/08/2007 0730

Date Received: 05/08/2007 0951

TX 1005 TPH by Texas 1005

Method: TX 1005

Analysis Batch: 560-11300

Instrument ID: Agilent GC [Method

Preparation: TX_1005_S_Prep

Prep Batch: 560-11236

Lab File ID: 05070754.D

Dilution: 1.0

Initial Weight/Volume: 10.01 g

Date Analyzed: 05/09/2007 1004

Final Weight/Volume: 10.0 mL

Date Prepared: 05/08/2007 1400

Injection Volume:

Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
>C12-C28		210		7.0	59
>C28-C35		120		7.0	59
C6-C12		ND		7.0	59
Total Petroleum Hydrocarbons (C6-C35)		330		7.0	59
Surrogate	%Rec				Acceptance Limits
o-Terphenyl		110			70 - 130

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-4594-1

General Chemistry

Client Sample ID: EXC 1 Sand

Lab Sample ID: 560-4594-1

Date Sampled: 05/08/2007 0730

Client Matrix: Solid

Date Received: 05/08/2007 0951

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	15		%	0.010	0.010	1.0	PercentMoisture
	Anly Batch: 560-11271	Date Analyzed	05/08/2007	1445			
Percent Solids	85		%	0.010	0.010	1.0	PercentMoisture
	Anly Batch: 560-11271	Date Analyzed	05/08/2007	1445			

DATA REPORTING QUALIFIERS

Client: Kleinfelder Inc

Job Number: 560-4594-1

Lab Section	Qualifier	Description
GC/MS VOA	F	MS or MSD exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
GC/MS Semi VOA	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

QUALITY CONTROL RESULTS

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

Method Blank - Batch: 560-11285

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 560-11285/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/09/2007 1449
Date Prepared: 05/09/2007 1449

Analysis Batch: 560-11285
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 05090712.D
Initial Weight/Volume: 5.00 g
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Acetone	ND		5.0	20
Acetonitrile	ND		5.0	50
Acrolein	ND		5.0	50
Acrylonitrile	ND		5.0	50
Benzene	ND		0.50	5.0
Bromoform	ND		0.50	5.0
Bromomethane	ND		0.34	5.0
Carbon disulfide	ND		0.30	5.0
Carbon tetrachloride	ND		0.50	5.0
Chlorobenzene	ND		0.50	5.0
Chlorodibromomethane	ND		0.50	5.0
Chloroethane	ND		0.50	5.0
Chloroform	ND		0.50	5.0
Chloromethane	ND		0.27	5.0
cis-1,2-Dichloroethene	ND		0.50	5.0
cis-1,3-Dichloropropene	ND		0.50	5.0
Dibromomethane	ND		0.50	5.0
Dichlorobromomethane	ND		0.50	5.0
Dichlorodifluoromethane	ND		0.50	5.0
1,1-Dichloroethane	ND		0.50	5.0
1,2-Dichloroethane	ND		0.50	5.0
1,1-Dichloroethene	ND		0.50	5.0
2,2-Dichloropropane	ND		0.50	5.0
1,2-Dichloropropane	ND		0.50	5.0
1,3-Dichloropropane	ND		0.50	5.0
1,1-Dichloropropene	ND		0.50	5.0
1,4-Dioxane	ND		9.2	100
Ethyl acetate	ND		0.34	5.0
Ethylbenzene	ND		0.50	5.0
Ethylene Dibromide	ND		0.50	5.0
Ethyl ether	ND		0.50	5.0
Ethyl methacrylate	ND		0.50	5.0
2-Hexanone	ND		0.25	5.0
Iodomethane	ND		0.50	5.0
Methylene Chloride	ND		5.0	20
Methyl Ethyl Ketone	ND		0.49	10
methyl isobutyl ketone	ND		0.50	5.0
Methyl methacrylate	ND		0.50	5.0
Methyl tert-butyl ether	ND		0.50	5.0
2-Nitropropane	ND		1.0	5.0
Styrene	ND		0.50	5.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

Method Blank - Batch: 560-11285

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 560-11285/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/09/2007 1449
Date Prepared: 05/09/2007 1449

Analysis Batch: 560-11285
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 05090712.D
Initial Weight/Volume: 5.00 g
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,2,2-Tetrachloroethane	ND		0.50	5.0
Tetrachloroethene	ND		0.50	5.0
Toluene	ND		0.50	5.0
trans-1,2-Dichloroethene	ND		0.50	5.0
trans-1,3-Dichloropropene	ND		0.50	5.0
1,2,3-Trichlorobenzene	ND		0.50	5.0
1,1,1-Trichloroethane	ND		0.50	5.0
1,1,2-Trichloroethane	ND		0.50	5.0
Trichloroethene	ND		0.50	5.0
Trichlorofluoromethane	ND		0.31	5.0
1,2,3-Trichloropropane	ND		0.50	5.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.27	5.0
1,3,5-Trimethylbenzene	ND		0.50	5.0
1,2,4-Trimethylbenzene	ND		0.50	5.0
Vinyl acetate	ND		0.50	5.0
Vinyl chloride	ND		0.50	5.0
Xylenes, Total	ND		1.5	15

Surrogate	% Rec	Acceptance Limits
Dibromofluoromethane (Surr)	104	59 - 120
1,2-Dichloroethane-d4 (Surr)	106	71 - 120
Toluene-d8 (Surr)	93	57 - 120
4-Bromofluorobenzene (Surr)	98	47 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

Laboratory Control Sample - Batch: 560-11285

Method: 8260B
Preparation: 5030B

Lab Sample ID: LCS 560-11285/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/09/2007 1330
Date Prepared: 05/09/2007 1330

Analysis Batch: 560-11285
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 05090709.D
Initial Weight/Volume: 5.00 g
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acetone	50.0	62.4	125	20 - 160	
Acetonitrile	500	583	117	60 - 151	
Acrolein	500	560	112	30 - 175	
Acrylonitrile	500	542	108	77 - 123	
Benzene	50.0	55.3	111	75 - 125	
Bromoform	50.0	46.3	93	55 - 135	
Bromomethane	50.0	54.7	109	30 - 160	
Carbon disulfide	50.0	58.7	117	45 - 160	
Carbon tetrachloride	50.0	59.5	119	65 - 135	
Chlorobenzene	50.0	51.3	103	75 - 125	
Chlorodibromomethane	50.0	54.0	108	65 - 130	
Chloroethane	50.0	55.5	111	40 - 155	
Chloroform	50.0	56.8	114	70 - 125	
Chloromethane	50.0	54.5	109	50 - 130	
cis-1,2-Dichloroethene	50.0	58.1	116	65 - 125	
cis-1,3-Dichloropropene	50.0	40.9	82	70 - 125	
Dibromomethane	50.0	52.9	106	75 - 130	
Dichlorobromomethane	50.0	54.6	109	70 - 130	
Dichlorodifluoromethane	50.0	48.9	98	35 - 135	
1,1-Dichloroethane	50.0	56.7	113	75 - 125	
1,2-Dichloroethane	50.0	55.6	111	70 - 135	
1,1-Dichloroethene	50.0	56.5	113	65 - 135	
2,2-Dichloropropane	50.0	65.8	132	65 - 135	
1,2-Dichloropropane	50.0	53.5	107	70 - 120	
1,3-Dichloropropane	50.0	48.7	97	75 - 125	
1,1-Dichloropropene	50.0	51.7	103	70 - 135	
1,4-Dioxane	1000	935	93	70 - 135	
Ethyl acetate	50.0	49.0	98	75 - 120	
Ethylbenzene	50.0	54.0	108	75 - 125	
Ethylene Dibromide	50.0	50.3	101	70 - 125	
Ethyl ether	50.0	58.6	117	80 - 131	
Ethyl methacrylate	50.0	43.6	87	45 - 121	
2-Hexanone	50.0	46.4	93	45 - 145	
Iodomethane	50.0	60.0	120	58 - 142	
Methylene Chloride	50.0	59.6	119	55 - 140	
Methyl Ethyl Ketone	50.0	47.2	94	30 - 160	
methyl isobutyl ketone	50.0	50.1	100	45 - 145	
Methyl methacrylate	50.0	44.1	88	80 - 132	
Methyl tert-butyl ether	50.0	57.9	116	78 - 126	
2-Nitropropane	50.0	50.6	101	54 - 123	
Styrene	50.0	54.0	108	75 - 125	
1,1,2,2-Tetrachloroethane	50.0	50.8	102	55 - 130	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

Laboratory Control Sample - Batch: 560-11285

Method: 8260B
Preparation: 5030B

Lab Sample ID: LCS 560-11285/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/09/2007 1330
Date Prepared: 05/09/2007 1330

Analysis Batch: 560-11285
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 05090709.D
Initial Weight/Volume: 5.00 g
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Tetrachloroethene	50.0	49.4	99	65 - 140	
Toluene	50.0	49.2	98	70 - 125	
trans-1,2-Dichloroethene	50.0	56.5	113	65 - 135	
trans-1,3-Dichloropropene	50.0	49.1	98	65 - 125	
1,2,3-Trichlorobenzene	50.0	60.4	121	60 - 135	
1,1,1-Trichloroethane	50.0	59.0	118	70 - 135	
1,1,2-Trichloroethane	50.0	50.8	102	60 - 125	
Trichloroethene	50.0	52.3	105	75 - 125	
Trichlorofluoromethane	50.0	57.0	114	25 - 185	
1,2,3-Trichloropropane	50.0	54.0	108	65 - 130	
1,1,2-Trichloro-1,2,2-trifluoroethane	50.0	52.2	104	64 - 120	
1,3,5-Trimethylbenzene	50.0	53.4	107	65 - 135	
1,2,4-Trimethylbenzene	50.0	53.3	107	65 - 135	
Vinyl acetate	50.0	55.4	111	80 - 153	
Vinyl chloride	50.0	56.6	113	60 - 125	
Xylenes, Total	150	163	108	80 - 120	

Surrogate	% Rec	Acceptance Limits
Dibromofluoromethane (Surr)	112	59 - 120
1,2-Dichloroethane-d4 (Surr)	108	71 - 120
Toluene-d8 (Surr)	97	57 - 120
4-Bromofluorobenzene (Surr)	101	47 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 560-11285**

**Method: 8260B
Preparation: 5030B**

MS Lab Sample ID: 560-4594-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/09/2007 1954
Date Prepared: 05/09/2007 1954

Analysis Batch: 560-11285
Prep Batch: N/A

Instrument ID: Agilent GCMS [Method 826
Lab File ID: 05090724.D
Initial Weight/Volume: 4.99 g
Final Weight/Volume: 5 mL

MSD Lab Sample ID: 560-4594-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/09/2007 2019
Date Prepared: 05/09/2007 2019

Analysis Batch: 560-11285
Prep Batch: N/A

Instrument ID: Agilent GCMS [Method 826
Lab File ID: 05090725.D
Initial Weight/Volume: 4.98 g
Final Weight/Volume: 5 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Acetone	126	129	20 - 160	2.6	30.0		
Acetonitrile	80	75	60 - 151	6.7	30.0		
Acrolein	50	57	50 - 175	14.2	30.0		
Acrylonitrile	90	96	77 - 123	6.1	30.0		
Benzene	79	71	75 - 125	6.8	30.0		F
Bromoform	61	69	55 - 135	12.7	30.0		
Bromomethane	66	77	30 - 160	16.3	30.0		
Carbon disulfide	63	63	45 - 160	0.5	30.0		
Carbon tetrachloride	57	64	65 - 135	12.4	30.0	F	F
Chlorobenzene	70	74	75 - 125	5.6	30.0	F	F
Chlorodibromomethane	78	85	65 - 130	8.3	30.0		
Chloroethane	63	72	40 - 155	13.4	30.0		
Chloroform	79	84	70 - 125	5.4	30.0		
Chloromethane	70	75	50 - 130	7.8	30.0		
cis-1,2-Dichloroethene	77	81	65 - 125	4.8	30.0		
cis-1,3-Dichloropropene	61	65	70 - 125	6.9	30.0	F	F
Dibromomethane	88	92	75 - 130	5.4	30.0		
Dichlorobromomethane	79	85	70 - 130	8.0	30.0		
Dichlorodifluoromethane	55	55	35 - 135	0.3	30.0		
1,1-Dichloroethane	77	80	75 - 125	4.3	30.0		
1,2-Dichloroethane	93	97	70 - 135	4.6	30.0		
1,1-Dichloroethene	69	71	65 - 135	2.7	30.0		
2,2-Dichloropropane	65	70	65 - 135	7.5	30.0		
1,2-Dichloropropane	80	85	70 - 120	6.5	30.0		
1,3-Dichloropropane	86	89	75 - 125	3.4	30.0		
1,1-Dichloropropene	59	63	70 - 135	5.6	30.0	F	F
1,4-Dioxane	93	71	70 - 135	27.2	30.0		
Ethyl acetate	77	77	75 - 120	0.7	30.0		
Ethylbenzene	66	66	75 - 125	0.2	30.0	F	F
Ethylene Dibromide	88	93	70 - 125	5.8	30.0		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 560-11285**

**Method: 8260B
Preparation: 5030B**

MS Lab Sample ID: 560-4594-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/09/2007 1954
Date Prepared: 05/09/2007 1954

Analysis Batch: 560-11285
Prep Batch: N/A

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 05090724.D
Initial Weight/Volume: 4.99 g
Final Weight/Volume: 5 mL

MSD Lab Sample ID: 560-4594-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/09/2007 2019
Date Prepared: 05/09/2007 2019

Analysis Batch: 560-11285
Prep Batch: N/A

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 05090725.D
Initial Weight/Volume: 4.98 g
Final Weight/Volume: 5 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Ethyl ether	96	101	80 - 131	5.4	30.0		
Ethyl methacrylate	73	78	45 - 121	6.4	30.0		
2-Hexanone	88	101	45 - 145	14.2	30.0		
Iodomethane	76	77	58 - 142	2.3	30.0		
Methylene Chloride	95	97	55 - 140	2.3	30.0		
Methyl Ethyl Ketone	89	95	30 - 160	6.4	30.0		
methyl isobutyl ketone	91	103	45 - 145	12.1	30.0		
Methyl methacrylate	92	98	80 - 132	6.8	30.0		
Methyl tert-butyl ether	93	100	78 - 126	8.1	30.0		
2-Nitropropane	88	93	54 - 123	5.0	30.0		
Styrene	73	79	75 - 125	7.5	30.0	F	
1,1,2,2-Tetrachloroethane	80	89	55 - 130	11.3	30.0		
Tetrachloroethene	73	82	65 - 140	11.7	30.0		
Toluene	62	65	70 - 125	3.8	30.0	F	F
trans-1,2-Dichloroethene	70	72	65 - 135	3.1	30.0		
trans-1,3-Dichloropropene	76	83	65 - 125	8.2	30.0		
1,2,3-Trichlorobenzene	46	53	60 - 135	14.2	30.0	F	F
1,1,1-Trichloroethane	63	67	70 - 135	6.4	30.0	F	F
1,1,2-Trichloroethane	89	94	60 - 125	5.3	30.0		
Trichloroethene	68	72	75 - 125	6.1	30.0	F	F
Trichlorofluoromethane	55	60	25 - 185	9.5	30.0		
1,2,3-Trichloropropane	93	102	65 - 130	8.9	30.0		
1,1,2-Trichloro-1,2,2-trifluoroethane	56	59	64 - 120	4.3	30.0	F	F
1,3,5-Trimethylbenzene	61	64	65 - 135	4.0	30.0	F	F
1,2,4-Trimethylbenzene	57	56	65 - 135	1.0	30.0	F	F
Vinyl acetate	31	32	80 - 153	3.8	30.0	F	F
Vinyl chloride	66	69	60 - 125	4.8	30.0		
Xylenes, Total	67	69	80 - 120	2.6	30.0	F	F

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
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Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
Dibromofluoromethane (Surr)	83	84	59 - 120
1,2-Dichloroethane-d4 (Surr)	91	94	71 - 120
Toluene-d8 (Surr)	66	67	57 - 120
4-Bromofluorobenzene (Surr)	75	77	47 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

**Matrix Spike/
Matrix Spike Duplicate Data Report - Batch: 560-11285**

**Method: 8260B
Preparation: 5030B**

MS Lab Sample ID: 560-4594-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/09/2007 1954
Date Prepared: 05/09/2007 1954

Units: ug/Kg

MSD Lab Sample ID: 560-4594-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/09/2007 2019
Date Prepared: 05/09/2007 2019

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual	
Acetone	ND		58.9	59.0	74.0	76.0	
Acetonitrile	ND		589	590	474	443	
Acrolein	ND		589	590	292	336	
Acrylonitrile	ND		589	590	530	564	
Benzene	24		58.9	59.0	70.7	66.0	F
Bromoform	ND		58.9	59.0	35.8	40.7	
Bromomethane	ND		58.9	59.0	38.8	45.6	
Carbon disulfide	0.81	J	58.9	59.0	37.8	38.0	
Carbon tetrachloride	ND		58.9	59.0	33.6	38.0	F
Chlorobenzene	ND		58.9	59.0	41.2	43.6	F
Chlorodibromomethane	ND		58.9	59.0	46.1	50.1	
Chloroethane	ND		58.9	59.0	37.3	42.6	
Chloroform	ND		58.9	59.0	46.8	49.4	
Chloromethane	ND		58.9	59.0	41.0	44.4	
cis-1,2-Dichloroethene	ND		58.9	59.0	45.6	47.9	
cis-1,3-Dichloropropene	ND		58.9	59.0	35.8	38.4	F
Dibromomethane	ND		58.9	59.0	51.6	54.4	
Dichlorobromomethane	ND		58.9	59.0	46.3	50.1	
Dichlorodifluoromethane	ND		58.9	59.0	32.4	32.3	
1,1-Dichloroethane	ND		58.9	59.0	45.2	47.1	
1,2-Dichloroethane	ND		58.9	59.0	54.8	57.3	
1,1-Dichloroethene	ND		58.9	59.0	40.8	41.9	
2,2-Dichloropropane	ND		58.9	59.0	38.5	41.6	
1,2-Dichloropropane	ND		58.9	59.0	47.2	50.4	
1,3-Dichloropropane	ND		58.9	59.0	50.5	52.2	
1,1-Dichloropropene	ND		58.9	59.0	35.0	37.0	F
1,4-Dioxane	ND		1180	1180	1100	837	
Ethyl acetate	ND		58.9	59.0	45.3	45.7	
Ethylbenzene	11		58.9	59.0	50.0	50.1	F
Ethylene Dibromide	ND		58.9	59.0	51.6	54.7	
Ethyl ether	ND		58.9	59.0	56.3	59.4	
Ethyl methacrylate	ND		58.9	59.0	43.1	45.9	
2-Hexanone	ND		58.9	59.0	51.6	59.5	
Iodomethane	ND		58.9	59.0	44.6	45.6	
Methylene Chloride	ND		58.9	59.0	55.9	57.2	
Methyl Ethyl Ketone	2.0	J	58.9	59.0	54.6	58.2	
methyl isobutyl ketone	ND		58.9	59.0	53.7	60.6	
Methyl methacrylate	ND		58.9	59.0	54.2	58.0	
Methyl tert-butyl ether	ND		58.9	59.0	54.6	59.2	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

**Matrix Spike/
Matrix Spike Duplicate Data Report - Batch: 560-11285**

**Method: 8260B
Preparation: 5030B**

MS Lab Sample ID: 560-4594-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/09/2007 1954
Date Prepared: 05/09/2007 1954

Units: ug/Kg

MSD Lab Sample ID: 560-4594-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/09/2007 2019
Date Prepared: 05/09/2007 2019

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
2-Nitropropane	ND	58.9	59.0	52.0	54.7
Styrene	ND	58.9	59.0	43.3 F	46.6
1,1,2,2-Tetrachloroethane	ND	58.9	59.0	47.2	52.8
Tetrachloroethene	ND	58.9	59.0	42.9	48.2
Toluene	2.4 J	58.9	59.0	39.2 F	40.7 F
trans-1,2-Dichloroethene	ND	58.9	59.0	41.3	42.6
trans-1,3-Dichloropropene	ND	58.9	59.0	44.9	48.8
1,2,3-Trichlorobenzene	ND	58.9	59.0	27.2 F	31.4 F
1,1,1-Trichloroethane	ND	58.9	59.0	37.1 F	39.6 F
1,1,2-Trichloroethane	ND	58.9	59.0	52.4	55.2
Trichloroethene	ND	58.9	59.0	40.1 F	42.6 F
Trichlorofluoromethane	ND	58.9	59.0	32.3	35.6
1,2,3-Trichloropropane	ND	58.9	59.0	54.9	60.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	58.9	59.0	33.2 F	34.6 F
1,3,5-Trimethylbenzene	12	58.9	59.0	47.6 F	49.6 F
1,2,4-Trimethylbenzene	38	58.9	59.0	71.3 F	70.6 F
Vinyl acetate	ND	58.9	59.0	18.3 F	19.0 F
Vinyl chloride	ND	58.9	59.0	38.6	40.5
Xylenes, Total	23	177	177	141 F	145 F

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

Method Blank - Batch: 560-11283

Method: 8270C
Preparation: 3550B

Lab Sample ID: MB 560-11283/1-AA
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/10/2007 0856
Date Prepared: 05/09/2007 0800

Analysis Batch: 560-11309
Prep Batch: 560-11283
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 8270]
Lab File ID: 05100705.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Acenaphthene	ND		50	330
Acenaphthylene	ND		50	330
Anthracene	ND		50	330
Benzo[a]anthracene	ND		50	330
Benzo[a]pyrene	ND		50	330
Benzo[b]fluoranthene	ND		50	330
Benzo[g,h,i]perylene	ND		50	330
Benzo[k]fluoranthene	ND		50	330
Benzyl alcohol	ND		50	330
Bis(2-chloroethoxy)methane	ND		50	330
Bis(2-chloroethyl)ether	ND		37	330
Bis(2-ethylhexyl) phthalate	ND		50	330
4-Bromophenyl phenyl ether	ND		50	330
Butyl benzyl phthalate	ND		50	330
4-Chloroaniline	ND		170	330
4-Chloro-3-methylphenol	ND		50	330
2-Chloronaphthalene	ND		50	330
2-Chlorophenol	ND		28	330
4-Chlorophenyl phenyl ether	ND		50	330
Chrysene	ND		50	330
Dibenz(a,h)anthracene	ND		50	330
Dibenzofuran	ND		50	330
1,3-Dichlorobenzene	ND		44	330
1,4-Dichlorobenzene	ND		46	330
1,2-Dichlorobenzene	ND		52	330
3,3'-Dichlorobenzidine	ND		170	330
2,4-Dichlorophenol	ND		50	330
Diethyl phthalate	ND		50	330
2,4-Dimethylphenol	ND		50	330
Dimethyl phthalate	ND		50	330
Di-n-butyl phthalate	ND		50	330
4,6-Dinitro-2-methylphenol	ND		170	1700
2,4-Dinitrophenol	ND		330	1700
2,6-Dinitrotoluene	ND		50	330
2,4-Dinitrotoluene	ND		170	330
Di-n-octyl phthalate	ND		50	330
Fluoranthene	ND		50	330
Fluorene	ND		50	330
Hexachlorobenzene	ND		50	330
Hexachlorobutadiene	ND		45	330
Hexachlorocyclopentadiene	ND		67	670

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

Method Blank - Batch: 560-11283

Method: 8270C
Preparation: 3550B

Lab Sample ID: MB 560-11283/1-AA
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/10/2007 0856
Date Prepared: 05/09/2007 0800

Analysis Batch: 560-11309
Prep Batch: 560-11283
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 8270]
Lab File ID: 05100705.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Hexachloroethane	ND		50	330
Indeno[1,2,3-cd]pyrene	ND		50	330
Isophorone	ND		50	330
2-Methylnaphthalene	ND		31	330
2-Methylphenol	ND		33	330
3 & 4 Methylphenol	ND		50	330
Naphthalene	ND		42	330
2-Nitroaniline	ND		50	330
3-Nitroaniline	ND		170	330
4-Nitroaniline	ND		28	330
Nitrobenzene	ND		36	330
2-Nitrophenol	ND		50	330
4-Nitrophenol	ND		170	1700
N-Nitrosodi-n-propylamine	ND		50	330
N-Nitrosodiphenylamine	ND		50	330
2,2'-oxybis(2-chloropropane)	ND		41	330
Pentachlorophenol	ND		170	1700
Phenanthrene	ND		50	330
Phenol	ND		50	330
Pyrene	ND		50	330
1,2,4-Trichlorobenzene	ND		46	330
2,4,6-Trichlorophenol	ND		50	330
2,4,5-Trichlorophenol	ND		50	330

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	81	45 - 105
2-Fluorophenol	81	35 - 105
Nitrobenzene-d5	74	35 - 100
Phenol-d5	81	40 - 100
Terphenyl-d14	96	30 - 125
2,4,6-Tribromophenol	93	35 - 125

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

Laboratory Control Sample - Batch: 560-11283

Method: 8270C
Preparation: 3550B

Lab Sample ID: LCS 560-11283/2-AA
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/10/2007 0924
Date Prepared: 05/09/2007 0800

Analysis Batch: 560-11309
Prep Batch: 560-11283
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 827
Lab File ID: 05100706.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	3330	2560	77	45 - 110	
Acenaphthylene	3330	2560	77	45 - 105	
Anthracene	3330	2610	78	55 - 105	
Benzo[a]anthracene	3330	2770	83	50 - 110	
Benzo[a]pyrene	3330	2740	82	50 - 110	
Benzo[b]fluoranthene	3330	2880	87	45 - 115	
Benzo[g,h,i]perylene	3330	2620	79	40 - 125	
Benzo[k]fluoranthene	3330	2730	82	45 - 125	
Benzyl alcohol	3330	2840	85	20 - 125	
Bis(2-chloroethoxy)methane	3330	2500	75	45 - 110	
Bis(2-chloroethyl)ether	3330	2210	66	40 - 105	
Bis(2-ethylhexyl) phthalate	3330	2810	84	45 - 125	
4-Bromophenyl phenyl ether	3330	2760	83	45 - 115	
Butyl benzyl phthalate	3330	2770	83	50 - 125	
4-Chloroaniline	3330	2390	72	25 - 125	
4-Chloro-3-methylphenol	3330	2690	81	45 - 115	
2-Chloronaphthalene	3330	2460	74	50 - 120	
2-Chlorophenol	3330	2520	76	45 - 105	
4-Chlorophenyl phenyl ether	3330	2680	81	45 - 110	
Chrysene	3330	2730	82	55 - 110	
Dibenz(a,h)anthracene	3330	2780	83	40 - 125	
Dibenzofuran	3330	2570	77	50 - 105	
1,3-Dichlorobenzene	3330	2190	66	40 - 100	
1,4-Dichlorobenzene	3330	2210	66	35 - 105	
1,2-Dichlorobenzene	3330	2210	66	45 - 95	
3,3'-Dichlorobenzidine	3330	2540	76	25 - 128	
2,4-Dichlorophenol	3330	2620	79	45 - 110	
Diethyl phthalate	3330	2720	81	50 - 115	
2,4-Dimethylphenol	3330	2690	81	30 - 105	
Dimethyl phthalate	3330	2720	82	50 - 110	
Di-n-butyl phthalate	3330	2740	82	55 - 110	
4,6-Dinitro-2-methylphenol	3330	2860	86	30 - 135	
2,4-Dinitrophenol	3330	2930	88	15 - 130	
2,6-Dinitrotoluene	3330	2740	82	50 - 110	
2,4-Dinitrotoluene	3330	2650	80	50 - 115	
Di-n-octyl phthalate	3330	2850	86	40 - 130	
Fluoranthene	3330	2650	79	55 - 115	
Fluorene	3330	2620	79	50 - 110	
Hexachlorobenzene	3330	2720	82	45 - 120	
Hexachlorobutadiene	3330	2410	72	40 - 115	
Hexachlorocyclopentadiene	3330	2310	69	44 - 120	
Hexachloroethane	3330	2140	64	35 - 110	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

Laboratory Control Sample - Batch: 560-11283

Method: 8270C

Preparation: 3550B

Lab Sample ID: LCS 560-11283/2-AA

Analysis Batch: 560-11309

Instrument ID: Agilent GCMS [Method 827

Client Matrix: Solid

Prep Batch: 560-11283

Lab File ID: 05100706.D

Dilution: 1.0

Units: ug/Kg

Initial Weight/Volume: 30 g

Date Analyzed: 05/10/2007 0924

Final Weight/Volume: 1 mL

Date Prepared: 05/09/2007 0800

Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Indeno[1,2,3-cd]pyrene	3330	2780	83	40 - 120	
Isophorone	3330	2360	71	45 - 110	
2-Methylnaphthalene	3330	2540	76	45 - 105	
2-Methylphenol	3330	2640	79	40 - 105	
3 & 4 Methylphenol	6670	5370	81	40 - 105	
Naphthalene	3330	2380	71	40 - 105	
2-Nitroaniline	3330	2610	78	45 - 120	
3-Nitroaniline	3330	2500	75	25 - 110	
4-Nitroaniline	3330	2530	76	35 - 115	
Nitrobenzene	3330	2320	70	40 - 115	
2-Nitrophenol	3330	2540	76	40 - 110	
4-Nitrophenol	3330	3240	97	15 - 140	
N-Nitrosodi-n-propylamine	3330	2430	73	40 - 115	
N-Nitrosodiphenylamine	3330	2650	80	50 - 115	
2,2'-oxybis(2-chloropropane)	3330	2240	67	20 - 115	
Pentachlorophenol	3330	2810	84	25 - 120	
Phenanthrene	3330	2670	80	50 - 110	
Phenol	3330	2350	70	40 - 100	
Pyrene	3330	2730	82	45 - 125	
1,2,4-Trichlorobenzene	3330	2380	71	45 - 110	
2,4,6-Trichlorophenol	3330	2770	83	45 - 110	
2,4,5-Trichlorophenol	3330	2740	82	50 - 110	

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	77	45 - 105
2-Fluorophenol	77	35 - 105
Nitrobenzene-d5	71	35 - 100
Phenol-d5	80	40 - 100
Terphenyl-d14	93	30 - 125
2,4,6-Tribromophenol	93	35 - 125

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

Method Blank - Batch: 560-11236

Method: TX 1005

Preparation: TX_1005_S_Prep

Lab Sample ID: MB 560-11236/1-AA
 Client Matrix: Solid
 Dilution: 1.0
 Date Analyzed: 05/08/2007 1749
 Date Prepared: 05/08/2007 1400

Analysis Batch: 560-11300
 Prep Batch: 560-11236
 Units: mg/Kg

Instrument ID: Agilent GC [Method
 Lab File ID: 05070706.D
 Initial Weight/Volume: 10.00 g
 Final Weight/Volume: 10.0 mL
 Injection Volume:

Analyte	Result	Qual	MDL	RL
>C12-C28	ND		6.0	50
>C28-C35	ND		6.0	50
C6-C12	ND		6.0	50
Total Petroleum Hydrocarbons (C6-C35)	ND		6.0	50

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	91	70 - 130

Laboratory Control/

Laboratory Control Duplicate Recovery Report - Batch: 560-11236

Method: TX 1005

Preparation: TX_1005_S_Prep

LCS Lab Sample ID: LCS 560-11236/2-AA
 Client Matrix: Solid
 Dilution: 1.0
 Date Analyzed: 05/08/2007 1830
 Date Prepared: 05/08/2007 1400

Analysis Batch: 560-11300
 Prep Batch: 560-11236
 Units: mg/Kg

Instrument ID: Agilent GC [Method
 Lab File ID: 05070708.D
 Initial Weight/Volume: 10.05 g
 Final Weight/Volume: 10.0 mL
 Injection Volume:

LCSD Lab Sample ID: LCSD 560-11236/3-AA
 Client Matrix: Solid
 Dilution: 1.0
 Date Analyzed: 05/08/2007 1910
 Date Prepared: 05/08/2007 1400

Analysis Batch: 560-11300
 Prep Batch: 560-11236
 Units: mg/Kg

Instrument ID: Agilent GC [Method
 Lab File ID: 05070710.D
 Initial Weight/Volume: 10.03 g
 Final Weight/Volume: 10.0 mL
 Injection Volume:

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Total Petroleum Hydrocarbons (C6-C35)	92	96	75 - 125	4	20		
Surrogate	LCS % Rec		LCSD % Rec		Acceptance Limits		
o-Terphenyl	90		92		70 - 130		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4594-1

**Laboratory Control/
Laboratory Duplicate Data Report - Batch: 560-11236**

**Method: TX 1005
Preparation: TX_1005_S_Prep**

LCS Lab Sample ID: LCS 560-11236/2-AA Units: mg/Kg
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/08/2007 1830
Date Prepared: 05/08/2007 1400

LCSD Lab Sample ID: LCSD
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/08/2007 1910
Date Prepared: 05/08/2007 1400

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Total Petroleum Hydrocarbons (C6-C35)	249	249	230	240

Calculations are performed before rounding to avoid round-off errors in calculated results.

CHAIN OF CUSTODY RECORD

[illegible]

REAROUND MAY REQUIRE SURCHARGE
05/10/2007

LOGIN SAMPLE RECEIPT CHECK LIST

Client: Kleinfelder Inc

Job Number: 560-4594-1

Login Number: 4594

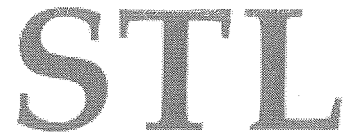
Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	NA	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	1.8C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	NA	
Samples do not require splitting or compositing.	NA	

CHAIN OF CUSTODY RECORD

[illegible]

*RUSH TURNAROUND MAY REQUIRE SURCHARGE

APPENDIX 2



ANALYTICAL REPORT

Job Number: 560-4634-1

Job Description: Falcon Refinery/59752

For:
Kleinfelder Inc
3601 Manor Road
Austin, TX 78723

Attention: Mr. Steve Halasz

Timothy L. Kellogg
Project Manager II
tkellogg@stl-inc.com
05/22/2007

Project Manager: Timothy L. Kellogg

The test results entered in this report meet all NELAC requirements for accredited parameters. Any exceptions to NELAC requirements are noted in the report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. STL Corpus Christi Certifications and Approvals: NELAC TX T104704210-06-TX, NELAC KS E-10362, NELAC LA 03034, Oklahoma 9968, USDA Soil Permit S-42935 Revised.

Severn Trent Laboratories, Inc.

STL Corpus Christi 1733 N. Padre Island Drive, Corpus Christi,
TX 78408

Tel (361) 289-2673 Fax (361) 289-2471 www.stl-inc.com Page 1 of 33



Job Narrative
560-J4634-1

Volatile Organic Compounds (VOCs) Analysis

Sample 560-4634-1 was analyzed for VOCs using EPA method 8260B. The percent recovery result for total xylenes analyte in the MSD associated with this sample was below acceptance limits. The matrix spike and LCS recoveries were within acceptable limits, therefore data is reported.

EXECUTIVE SUMMARY - Detections

Client: Kleinfelder Inc

Job Number: 560-4634-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
560-4634-1	FLOOR 1 TAN SAND					
Acetone		9.3	J	23	ug/Kg	8260B
1,1-Dichloroethene		3.0	J	5.8	ug/Kg	8260B
Methylene Chloride		6.8	J	23	ug/Kg	8260B
Percent Moisture		15		0.010	%	PercentMoisture
Percent Solids		85		0.010	%	PercentMoisture

METHOD SUMMARY

Client: Kleinfelder Inc

Job Number: 560-4634-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Volatile Organic Compounds by GC/MS	STL CC	SW846 8260B	
Purge and Trap for Solids	STL CC		SW846 5030B
Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	STL CC	SW846 8270C	
Ultrasonic Extraction	STL CC		SW846 3550B
TPH by Texas 1005	STL CC	TCEQ TX 1005	
TPH by Texas 1005 Solid Prep	STL CC		TCEQ TX_1005_S_Prep
Percent Moisture	STL CC	EPA PercentMoisture	

LAB REFERENCES:

STL CC = STL Corpus Christi

METHOD REFERENCES:

TCEQ - Texas Commission of Environmental Quality

SW846 - "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

EPA - US Environmental Protection Agency

METHOD / ANALYST SUMMARY

Client: Kleinfelder Inc

Job Number: 560-4634-1

Method	Analyst	Analyst ID
SW846 8260B	Newman, David	DN
SW846 8270C	Fisher, Gayland E	GEF
TCEQ TX 1005	Cady, Iryna M	IMC
EPA PercentMoisture	Zwierzykowski, Hanna M	HMZ

SAMPLE SUMMARY

Client: Kleinfelder Inc

Job Number: 560-4634-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
560-4634-1	FLOOR 1 TAN SAND	Solid	05/11/2007 0930	05/11/2007 1045

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-4634-1

Client Sample ID: FLOOR 1 TAN SAND

Lab Sample ID: 560-4634-1

Client Matrix: Solid

% Moisture: 14.8

Date Sampled: 05/11/2007 0930

Date Received: 05/11/2007 1045

8260B Volatile Organic Compounds by GC/MS

Method: 8260B

Analysis Batch: 560-11383

Instrument ID: Agilent GCMS [Method

Preparation: 5030B

Lab File ID: 05140707.D

Dilution: 1.0

Initial Weight/Volume: 5.08 g

Date Analyzed: 05/14/2007 1331

Final Weight/Volume: 5 mL

Date Prepared: 05/14/2007 1331

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		9.3	J	5.8	23
Acetonitrile		ND		5.8	58
Acrolein		ND		5.8	58
Acrylonitrile		ND		5.8	58
Benzene		ND		0.58	5.8
Bromoform		ND		0.58	5.8
Bromomethane		ND		0.39	5.8
Carbon disulfide		ND		0.35	5.8
Carbon tetrachloride		ND		0.58	5.8
Chlorobenzene		ND		0.58	5.8
Chlorodibromomethane		ND		0.58	5.8
Chloroethane		ND		0.58	5.8
Chloroform		ND		0.58	5.8
Chloromethane		ND		0.31	5.8
cis-1,2-Dichloroethene		ND		0.58	5.8
cis-1,3-Dichloropropene		ND		0.58	5.8
Dibromomethane		ND		0.58	5.8
Dichlorobromomethane		ND		0.58	5.8
Dichlorodifluoromethane		ND		0.58	5.8
1,1-Dichloroethane		ND		0.58	5.8
1,2-Dichloroethane		ND		0.58	5.8
1,1-Dichloroethene		3.0	J	0.58	5.8
2,2-Dichloropropane		ND		0.58	5.8
1,2-Dichloropropane		ND		0.58	5.8
1,3-Dichloropropane		ND		0.58	5.8
1,1-Dichloropropene		ND		0.58	5.8
1,4-Dioxane		ND		11	120
Ethyl acetate		ND		0.39	5.8
Ethylbenzene		ND		0.58	5.8
Ethylene Dibromide		ND		0.58	5.8
Ethyl ether		ND		0.58	5.8
Ethyl methacrylate		ND		0.58	5.8
2-Hexanone		ND		0.29	5.8
Iodomethane		ND		0.58	5.8
Methylene Chloride		6.8	J	5.8	23
Methyl Ethyl Ketone		ND		0.57	12
methyl isobutyl ketone		ND		0.58	5.8
Methyl methacrylate		ND		0.58	5.8
Methyl tert-butyl ether		ND		0.58	5.8
2-Nitropropane		ND		1.2	5.8
Styrene		ND		0.58	5.8
1,1,2,2-Tetrachloroethane		ND		0.58	5.8
Tetrachloroethene		ND		0.58	5.8

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-4634-1

Client Sample ID: FLOOR 1 TAN SAND

Lab Sample ID: 560-4634-1

Client Matrix: Solid

% Moisture: 14.8

Date Sampled: 05/11/2007 0930

Date Received: 05/11/2007 1045

8260B Volatile Organic Compounds by GC/MS

Method: 8260B

Analysis Batch: 560-11383

Instrument ID: Agilent GCMS [Method

Preparation: 5030B

Lab File ID: 05140707.D

Dilution: 1.0

Initial Weight/Volume: 5.08 g

Date Analyzed: 05/14/2007 1331

Final Weight/Volume: 5 mL

Date Prepared: 05/14/2007 1331

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Toluene		ND		0.58	5.8
trans-1,2-Dichloroethene		ND		0.58	5.8
trans-1,3-Dichloropropene		ND		0.58	5.8
1,2,3-Trichlorobenzene		ND		0.58	5.8
1,1,1-Trichloroethane		ND		0.58	5.8
1,1,2-Trichloroethane		ND		0.58	5.8
Trichloroethene		ND		0.58	5.8
Trichlorofluoromethane		ND		0.36	5.8
1,2,3-Trichloropropane		ND		0.58	5.8
1,1,2-Trichloro-1,2,2-trifluoroethane		ND		0.31	5.8
1,3,5-Trimethylbenzene		ND		0.58	5.8
1,2,4-Trimethylbenzene		ND		0.58	5.8
Vinyl acetate		ND		0.58	5.8
Vinyl chloride		ND		0.58	5.8
Xylenes, Total		ND		1.7	17
Surrogate	%Rec	Acceptance Limits			
Dibromofluoromethane (Surr)	98	59 - 120			
1,2-Dichloroethane-d4 (Surr)	99	71 - 120			
Toluene-d8 (Surr)	96	57 - 120			
4-Bromofluorobenzene (Surr)	102	47 - 120			

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-4634-1

Client Sample ID: FLOOR 1 TAN SAND

Lab Sample ID: 560-4634-1

Client Matrix: Solid

% Moisture: 14.8

Date Sampled: 05/11/2007 0930

Date Received: 05/11/2007 1045

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C

Analysis Batch: 560-11401

Instrument ID: Agilent GCMS [Method

Preparation: 3550B

Prep Batch: 560-11358

Lab File ID: 05140717.D

Dilution: 1.0

Initial Weight/Volume: 30 g

Date Analyzed: 05/14/2007 1703

Final Weight/Volume: 1 mL

Date Prepared: 05/11/2007 0900

Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		ND		59	390
Acenaphthylene		ND		59	390
Anthracene		ND		59	390
Benzo[a]anthracene		ND		59	390
Benzo[a]pyrene		ND		59	390
Benzo[b]fluoranthene		ND		59	390
Benzo[g,h,i]perylene		ND		59	390
Benzo[k]fluoranthene		ND		59	390
Benzyl alcohol		ND		59	390
Bis(2-chloroethoxy)methane		ND		59	390
Bis(2-chloroethyl)ether		ND		44	390
Bis(2-ethylhexyl) phthalate		ND		59	390
4-Bromophenyl phenyl ether		ND		59	390
Butyl benzyl phthalate		ND		59	390
4-Chloroaniline		ND		200	390
4-Chloro-3-methylphenol		ND		59	390
2-Chloronaphthalene		ND		59	390
2-Chlorophenol		ND		33	390
4-Chlorophenyl phenyl ether		ND		59	390
Chrysene		ND		59	390
Dibenz(a,h)anthracene		ND		59	390
Dibenzofuran		ND		59	390
1,3-Dichlorobenzene		ND		51	390
1,4-Dichlorobenzene		ND		54	390
1,2-Dichlorobenzene		ND		61	390
3,3'-Dichlorobenzidine		ND		200	390
2,4-Dichlorophenol		ND		59	390
Diethyl phthalate		ND		59	390
2,4-Dimethylphenol		ND		59	390
Dimethyl phthalate		ND		59	390
Di-n-butyl phthalate		ND		59	390
4,6-Dinitro-2-methylphenol		ND		200	2000
2,4-Dinitrophenol		ND		390	2000
2,6-Dinitrotoluene		ND		59	390
2,4-Dinitrotoluene		ND		200	390
Di-n-octyl phthalate		ND		59	390
Fluoranthene		ND		59	390
Fluorene		ND		59	390
Hexachlorobenzene		ND		59	390
Hexachlorobutadiene		ND		52	390
Hexachlorocyclopentadiene		ND		78	790
Hexachloroethane		ND		59	390
Indeno[1,2,3-cd]pyrene		ND		59	390

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-4634-1

Client Sample ID: FLOOR 1 TAN SAND

Lab Sample ID: 560-4634-1

Client Matrix: Solid

% Moisture: 14.8

Date Sampled: 05/11/2007 0930

Date Received: 05/11/2007 1045

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C

Analysis Batch: 560-11401

Instrument ID: Agilent GCMS [Method

Preparation: 3550B

Prep Batch: 560-11358

Lab File ID: 05140717.D

Dilution: 1.0

Initial Weight/Volume: 30 g

Date Analyzed: 05/14/2007 1703

Final Weight/Volume: 1 mL

Date Prepared: 05/11/2007 0900

Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Isophorone		ND		59	390
2-Methylnaphthalene		ND		37	390
2-Methylphenol		ND		39	390
3 & 4 Methylphenol		ND		59	390
Naphthalene		ND		49	390
2-Nitroaniline		ND		59	390
3-Nitroaniline		ND		200	390
4-Nitroaniline		ND		33	390
Nitrobenzene		ND		43	390
2-Nitrophenol		ND		59	390
4-Nitrophenol		ND		200	2000
N-Nitrosodi-n-propylamine		ND		59	390
N-Nitrosodiphenylamine		ND		59	390
2,2'-oxybis(2-chloropropane)		ND		48	390
Pentachlorophenol		ND		200	2000
Phenanthrene		ND		59	390
Phenol		ND		59	390
Pyrene		ND		59	390
1,2,4-Trichlorobenzene		ND		54	390
2,4,6-Trichlorophenol		ND		59	390
2,4,5-Trichlorophenol		ND		59	390

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	82	45 - 105
2-Fluorophenol	81	35 - 105
Nitrobenzene-d5	77	35 - 100
Phenol-d5	81	40 - 100
Terphenyl-d14	99	30 - 125
2,4,6-Tribromophenol	101	35 - 125

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-4634-1

Client Sample ID: FLOOR 1 TAN SAND

Lab Sample ID: 560-4634-1

Client Matrix: Solid

% Moisture: 14.8

Date Sampled: 05/11/2007 0930

Date Received: 05/11/2007 1045

TX 1005 TPH by Texas 1005

Method: TX 1005

Analysis Batch: 560-11387

Instrument ID: Hewlett Packard GC

Preparation: TX_1005_S_Prep

Prep Batch: 560-11351

Lab File ID: 05110735.D

Dilution: 1.0

Initial Weight/Volume: 10.03 g

Date Analyzed: 05/11/2007 1802

Final Weight/Volume: 10.0 mL

Date Prepared: 05/11/2007 1400

Injection Volume:

Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
>C12-C28		ND		7.0	59
>C28-C35		ND		7.0	59
C6-C12		ND		7.0	59
Total Petroleum Hydrocarbons (C6-C35)		ND		7.0	59
Surrogate		%Rec		Acceptance Limits	
o-Terphenyl		102		70 - 130	

Analytical Data

Client: Kleinfelder Inc

Job Number: 560-4634-1

General Chemistry

Client Sample ID: FLOOR 1 TAN SAND

Lab Sample ID: 560-4634-1

Date Sampled: 05/11/2007 0930

Client Matrix: Solid

Date Received: 05/11/2007 1045

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	15		%	0.010	0.010	1.0	PercentMoisture
	Anly Batch: 560-11370	Date Analyzed	05/14/2007	0835			
Percent Solids	85		%	0.010	0.010	1.0	PercentMoisture
	Anly Batch: 560-11370	Date Analyzed	05/14/2007	0835			

DATA REPORTING QUALIFIERS

Client: Kleinfelder Inc

Job Number: 560-4634-1

Lab Section	Qualifier	Description
GC/MS VOA		
	F	MS or MSD exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

QUALITY CONTROL RESULTS

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

Method Blank - Batch: 560-11383

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 560-11383/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/14/2007 1305
Date Prepared: 05/14/2007 1305

Analysis Batch: 560-11383
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 05140706.D
Initial Weight/Volume: 5.00 g
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Acetone	ND		5.0	20
Acetonitrile	ND		5.0	50
Acrolein	ND		5.0	50
Acrylonitrile	ND		5.0	50
Benzene	ND		0.50	5.0
Bromoform	ND		0.50	5.0
Bromomethane	ND		0.34	5.0
Carbon disulfide	ND		0.30	5.0
Carbon tetrachloride	ND		0.50	5.0
Chlorobenzene	ND		0.50	5.0
Chlorodibromomethane	ND		0.50	5.0
Chloroethane	ND		0.50	5.0
Chloroform	ND		0.50	5.0
Chloromethane	ND		0.27	5.0
cis-1,2-Dichloroethene	ND		0.50	5.0
cis-1,3-Dichloropropene	ND		0.50	5.0
Dibromomethane	ND		0.50	5.0
Dichlorobromomethane	ND		0.50	5.0
Dichlorodifluoromethane	ND		0.50	5.0
1,1-Dichloroethane	ND		0.50	5.0
1,2-Dichloroethane	ND		0.50	5.0
1,1-Dichloroethene	ND		0.50	5.0
2,2-Dichloropropane	ND		0.50	5.0
1,2-Dichloropropane	ND		0.50	5.0
1,3-Dichloropropane	ND		0.50	5.0
1,1-Dichloropropene	ND		0.50	5.0
1,4-Dioxane	ND		9.2	100
Ethyl acetate	ND		0.34	5.0
Ethylbenzene	ND		0.50	5.0
Ethylene Dibromide	ND		0.50	5.0
Ethyl ether	ND		0.50	5.0
Ethyl methacrylate	ND		0.50	5.0
2-Hexanone	ND		0.25	5.0
Iodomethane	ND		0.50	5.0
Methylene Chloride	ND		5.0	20
Methyl Ethyl Ketone	ND		0.49	10
methyl isobutyl ketone	ND		0.50	5.0
Methyl methacrylate	ND		0.50	5.0
Methyl tert-butyl ether	ND		0.50	5.0
2-Nitropropane	ND		1.0	5.0
Styrene	ND		0.50	5.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

Method Blank - Batch: 560-11383

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 560-11383/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/14/2007 1305
Date Prepared: 05/14/2007 1305

Analysis Batch: 560-11383
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 05140706.D
Initial Weight/Volume: 5.00 g
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,2,2-Tetrachloroethane	ND		0.50	5.0
Tetrachloroethene	ND		0.50	5.0
Toluene	ND		0.50	5.0
trans-1,2-Dichloroethene	ND		0.50	5.0
trans-1,3-Dichloropropene	ND		0.50	5.0
1,2,3-Trichlorobenzene	ND		0.50	5.0
1,1,1-Trichloroethane	ND		0.50	5.0
1,1,2-Trichloroethane	ND		0.50	5.0
Trichloroethene	ND		0.50	5.0
Trichlorofluoromethane	ND		0.31	5.0
1,2,3-Trichloropropane	ND		0.50	5.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.27	5.0
1,3,5-Trimethylbenzene	ND		0.50	5.0
1,2,4-Trimethylbenzene	ND		0.50	5.0
Vinyl acetate	ND		0.50	5.0
Vinyl chloride	ND		0.50	5.0
Xylenes, Total	ND		1.5	15

Surrogate	% Rec	Acceptance Limits
Dibromofluoromethane (Surr)	96	59 - 120
1,2-Dichloroethane-d4 (Surr)	99	71 - 120
Toluene-d8 (Surr)	89	57 - 120
4-Bromofluorobenzene (Surr)	92	47 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

Laboratory Control Sample - Batch: 560-11383

Method: 8260B

Preparation: 5030B

Lab Sample ID: LCS 560-11383/1

Analysis Batch: 560-11383

Instrument ID: Agilent GCMS [Method 8260B]

Client Matrix: Solid

Prep Batch: N/A

Lab File ID: 05140703.D

Dilution: 1.0

Units: ug/Kg

Initial Weight/Volume: 5.00 g

Date Analyzed: 05/14/2007 1149

Final Weight/Volume: 5 mL

Date Prepared: 05/14/2007 1149

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acetone	50.0	58.9	118	20 - 160	
Acetonitrile	500	532	106	60 - 151	
Acrolein	500	501	100	30 - 175	
Acrylonitrile	500	520	104	77 - 123	
Benzene	50.0	46.8	94	75 - 125	
Bromoform	50.0	40.0	80	55 - 135	
Bromomethane	50.0	52.4	105	30 - 160	
Carbon disulfide	50.0	46.9	94	45 - 160	
Carbon tetrachloride	50.0	46.2	92	65 - 135	
Chlorobenzene	50.0	43.1	86	75 - 125	
Chlorodibromomethane	50.0	46.9	94	65 - 130	
Chloroethane	50.0	49.0	98	40 - 155	
Chloroform	50.0	49.5	99	70 - 125	
Chloromethane	50.0	49.4	99	50 - 130	
cis-1,2-Dichloroethene	50.0	50.0	100	65 - 125	
cis-1,3-Dichloropropene	50.0	36.8	74	70 - 125	
Dibromomethane	50.0	49.4	99	75 - 130	
Dichlorobromomethane	50.0	48.4	97	70 - 130	
Dichlorodifluoromethane	50.0	38.5	77	35 - 135	
1,1-Dichloroethane	50.0	49.0	98	75 - 125	
1,2-Dichloroethane	50.0	51.0	102	70 - 135	
1,1-Dichloroethene	50.0	45.9	92	65 - 135	
2,2-Dichloropropane	50.0	54.8	110	65 - 135	
1,2-Dichloropropane	50.0	46.6	93	70 - 120	
1,3-Dichloropropane	50.0	44.1	88	75 - 125	
1,1-Dichloropropene	50.0	42.1	84	70 - 135	
1,4-Dioxane	1000	1090	109	70 - 135	
Ethyl acetate	50.0	49.4	99	75 - 120	
Ethylbenzene	50.0	43.6	87	75 - 125	
Ethylene Dibromide	50.0	46.4	93	70 - 125	
Ethyl ether	50.0	53.5	107	80 - 131	
Ethyl methacrylate	50.0	42.4	85	45 - 121	
2-Hexanone	50.0	49.6	99	45 - 145	
Iodomethane	50.0	51.2	102	58 - 142	
Methylene Chloride	50.0	53.8	108	55 - 140	
Methyl Ethyl Ketone	50.0	48.9	98	30 - 160	
methyl isobutyl ketone	50.0	50.4	101	45 - 145	
Methyl methacrylate	50.0	44.7	89	80 - 132	
Methyl tert-butyl ether	50.0	53.7	107	78 - 126	
2-Nitropropane	50.0	52.2	104	54 - 123	
Styrene	50.0	44.8	90	75 - 125	
1,1,2,2-Tetrachloroethane	50.0	47.2	94	55 - 130	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

Laboratory Control Sample - Batch: 560-11383

Method: 8260B
Preparation: 5030B

Lab Sample ID: LCS 560-11383/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/14/2007 1149
Date Prepared: 05/14/2007 1149

Analysis Batch: 560-11383
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 05140703.D
Initial Weight/Volume: 5.00 g
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Tetrachloroethene	50.0	43.1	86	65 - 140	
Toluene	50.0	41.7	83	70 - 125	
trans-1,2-Dichloroethene	50.0	47.6	95	65 - 135	
trans-1,3-Dichloropropene	50.0	45.9	92	65 - 125	
1,2,3-Trichlorobenzene	50.0	50.6	101	60 - 135	
1,1,1-Trichloroethane	50.0	48.9	98	70 - 135	
1,1,2-Trichloroethane	50.0	46.6	93	60 - 125	
Trichloroethene	50.0	43.9	88	75 - 125	
Trichlorofluoromethane	50.0	51.2	102	25 - 185	
1,2,3-Trichloropropane	50.0	51.9	104	65 - 130	
1,1,2-Trichloro-1,2,2-trifluoroethane	50.0	41.5	83	64 - 120	
1,3,5-Trimethylbenzene	50.0	43.4	87	65 - 135	
1,2,4-Trimethylbenzene	50.0	43.9	88	65 - 135	
Vinyl acetate	50.0	48.3	97	80 - 153	
Vinyl chloride	50.0	46.7	93	60 - 125	
Xylenes, Total	150	130	87	80 - 120	

Surrogate	% Rec	Acceptance Limits
Dibromofluoromethane (Surr)	102	59 - 120
1,2-Dichloroethane-d4 (Surr)	104	71 - 120
Toluene-d8 (Surr)	89	57 - 120
4-Bromofluorobenzene (Surr)	92	47 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 560-11383

Method: 8260B
Preparation: 5030B

MS Lab Sample ID: 560-4634-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/14/2007 1500
Date Prepared: 05/14/2007 1500

Analysis Batch: 560-11383
Prep Batch: N/A

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 05140710.D
Initial Weight/Volume: 5.15 mL
Final Weight/Volume: 5 mL

MSD Lab Sample ID: 560-4634-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/14/2007 1526
Date Prepared: 05/14/2007 1526

Analysis Batch: 560-11383
Prep Batch: N/A

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 05140711.D
Initial Weight/Volume: 5.14 mL
Final Weight/Volume: 5 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Acetone	84	94	20 - 160	10.3	30.0		
Acetonitrile	90	91	60 - 151	1.3	30.0		
Acrolein	85	89	50 - 175	4.9	30.0		
Acrylonitrile	88	94	77 - 123	6.3	30.0		
Benzene	88	84	75 - 125	4.4	30.0		
Bromoform	68	74	55 - 135	8.9	30.0		
Bromomethane	94	90	30 - 160	4.8	30.0		
Carbon disulfide	86	81	45 - 160	5.2	30.0		
Carbon tetrachloride	79	79	65 - 135	0.5	30.0		
Chlorobenzene	85	83	75 - 125	3.1	30.0		
Chlorodibromomethane	87	90	65 - 130	3.7	30.0		
Chloroethane	87	84	40 - 155	3.7	30.0		
Chloroform	93	89	70 - 125	3.6	30.0		
Chloromethane	86	82	50 - 130	4.6	30.0		
cis-1,2-Dichloroethene	91	88	65 - 125	3.4	30.0		
cis-1,3-Dichloropropene	75	75	70 - 125	0.5	30.0		
Dibromomethane	93	94	75 - 130	1.3	30.0		
Dichlorobromomethane	92	90	70 - 130	1.1	30.0		
Dichlorodifluoromethane	67	65	35 - 135	3.6	30.0		
1,1-Dichloroethane	90	86	75 - 125	3.5	30.0		
1,2-Dichloroethane	98	95	70 - 135	2.8	30.0		
1,1-Dichloroethene	78	76	65 - 135	2.0	30.0		
2,2-Dichloropropane	92	88	65 - 135	4.4	30.0		
1,2-Dichloropropane	91	89	70 - 120	2.5	30.0		
1,3-Dichloropropane	90	91	75 - 125	1.4	30.0		
1,1-Dichloropropene	80	75	70 - 135	6.2	30.0		
1,4-Dioxane	80	86	70 - 135	7.3	30.0		
Ethyl acetate	91	102	75 - 120	11.0	30.0		
Ethylbenzene	83	80	75 - 125	4.2	30.0		
Ethylene Dibromide	91	95	70 - 125	4.3	30.0		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 560-11383**

**Method: 8260B
Preparation: 5030B**

MS Lab Sample ID: 560-4634-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/14/2007 1500
Date Prepared: 05/14/2007 1500

Analysis Batch: 560-11383
Prep Batch: N/A

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 05140710.D
Initial Weight/Volume: 5.15 mL
Final Weight/Volume: 5 mL

MSD Lab Sample ID: 560-4634-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/14/2007 1526
Date Prepared: 05/14/2007 1526

Analysis Batch: 560-11383
Prep Batch: N/A

Instrument ID: Agilent GCMS [Method 8260]
Lab File ID: 05140711.D
Initial Weight/Volume: 5.14 mL
Final Weight/Volume: 5 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Ethyl ether	99	100	80 - 131	0.7	30.0		
Ethyl methacrylate	81	86	45 - 121	6.4	30.0		
2-Hexanone	81	97	45 - 145	18.3	30.0		
Iodomethane	94	90	58 - 142	4.3	30.0		
Methylene Chloride	95	93	55 - 140	1.6	30.0		
Methyl Ethyl Ketone	83	93	30 - 160	12.1	30.0		
methyl isobutyl ketone	90	97	45 - 145	8.6	30.0		
Methyl methacrylate	85	95	80 - 132	10.6	30.0		
Methyl tert-butyl ether	99	98	78 - 126	0.9	30.0		
2-Nitropropane	82	98	54 - 123	17.8	30.0		
Styrene	89	85	75 - 125	4.3	30.0		
1,1,2,2-Tetrachloroethane	89	93	55 - 130	4.9	30.0		
Tetrachloroethene	79	76	65 - 140	3.7	30.0		
Toluene	84	80	70 - 125	5.1	30.0		
trans-1,2-Dichloroethene	87	83	65 - 135	4.4	30.0		
trans-1,3-Dichloropropene	95	96	65 - 125	1.6	30.0		
1,2,3-Trichlorobenzene	95	91	60 - 135	4.1	30.0		
1,1,1-Trichloroethane	86	83	70 - 135	3.0	30.0		
1,1,2-Trichloroethane	92	93	60 - 125	1.3	30.0		
Trichloroethene	82	79	75 - 125	4.1	30.0		
Trichlorofluoromethane	86	81	25 - 185	5.6	30.0		
1,2,3-Trichloropropane	97	102	65 - 130	4.9	30.0		
1,1,2-Trichloro-1,2,2-trifluoroethane	74	71	64 - 120	3.1	30.0		
1,3,5-Trimethylbenzene	84	79	65 - 135	5.6	30.0		
1,2,4-Trimethylbenzene	85	81	65 - 135	4.7	30.0		
Vinyl acetate	87	93	80 - 153	6.7	30.0		
Vinyl chloride	83	77	60 - 125	6.3	30.0		
Xylenes, Total	83	79	80 - 120	4.8	30.0		F

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
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Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
Dibromofluoromethane (Surr)	95	92	59 - 120
1,2-Dichloroethane-d4 (Surr)	95	95	71 - 120
Toluene-d8 (Surr)	85	84	57 - 120
4-Bromofluorobenzene (Surr)	85	87	47 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

Matrix Spike/ Matrix Spike Duplicate Data Report - Batch: 560-11383

Method: 8260B
Preparation: 5030B

MS Lab Sample ID: 560-4634-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/14/2007 1500
Date Prepared: 05/14/2007 1500

Units: ug/Kg

MSD Lab Sample ID: 560-4634-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/14/2007 1526
Date Prepared: 05/14/2007 1526

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Acetone	9.3	J	57.0	57.1	57.0	63.2
Acetonitrile	ND		57.0	57.1	51.2	51.9
Acrolein	ND		57.0	57.1	48.4	50.9
Acrylonitrile	ND		57.0	57.1	50.4	53.6
Benzene	ND		57.0	57.1	50.3	48.2
Bromoform	ND		57.0	57.1	38.7	42.3
Bromomethane	ND		57.0	57.1	53.7	51.2
Carbon disulfide	ND		57.0	57.1	48.9	46.4
Carbon tetrachloride	ND		57.0	57.1	44.8	45.1
Chlorobenzene	ND		57.0	57.1	48.6	47.1
Chlorodibromomethane	ND		57.0	57.1	49.5	51.3
Chloroethane	ND		57.0	57.1	49.6	47.8
Chloroform	ND		57.0	57.1	52.9	51.0
Chloromethane	ND		57.0	57.1	48.8	46.6
cis-1,2-Dichloroethene	ND		57.0	57.1	52.1	50.3
cis-1,3-Dichloropropene	ND		57.0	57.1	42.9	42.7
Dibromomethane	ND		57.0	57.1	52.8	53.5
Dichlorobromomethane	ND		57.0	57.1	52.2	51.7
Dichlorodifluoromethane	ND		57.0	57.1	38.2	36.9
1,1-Dichloroethane	ND		57.0	57.1	51.1	49.3
1,2-Dichloroethane	ND		57.0	57.1	55.6	54.0
1,1-Dichloroethene	3.0	J	57.0	57.1	47.7	46.7
2,2-Dichloropropane	ND		57.0	57.1	52.6	50.4
1,2-Dichloropropane	ND		57.0	57.1	52.1	50.8
1,3-Dichloropropane	ND		57.0	57.1	51.5	52.2
1,1-Dichloropropene	ND		57.0	57.1	45.4	42.6
1,4-Dioxane	ND		1140	1140	910	980
Ethyl acetate	ND		57.0	57.1	52.0	58.0
Ethylbenzene	ND		57.0	57.1	47.4	45.4
Ethylene Dibromide	ND		57.0	57.1	51.8	54.1
Ethyl ether	ND		57.0	57.1	56.5	56.9
Ethyl methacrylate	ND		57.0	57.1	46.3	49.4
2-Hexanone	ND		57.0	57.1	46.3	55.7
Iodomethane	ND		57.0	57.1	53.6	51.4
Methylene Chloride	6.8	J	57.0	57.1	60.7	59.8
Methyl Ethyl Ketone	ND		57.0	57.1	47.2	53.3
methyl isobutyl ketone	ND		57.0	57.1	51.0	55.6
Methyl methacrylate	ND		57.0	57.1	48.7	54.2
Methyl tert-butyl ether	ND		57.0	57.1	56.5	56.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

**Matrix Spike/
Matrix Spike Duplicate Data Report - Batch: 560-11383**

**Method: 8260B
Preparation: 5030B**

MS Lab Sample ID: 560-4634-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/14/2007 1500
Date Prepared: 05/14/2007 1500

Units: ug/Kg

MSD Lab Sample ID: 560-4634-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/14/2007 1526
Date Prepared: 05/14/2007 1526

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
2-Nitropropane	ND	57.0	57.1	47.0	56.2
Styrene	ND	57.0	57.1	50.8	48.7
1,1,2,2-Tetrachloroethane	ND	57.0	57.1	50.5	53.0
Tetrachloroethene	ND	57.0	57.1	45.3	43.7
Toluene	ND	57.0	57.1	47.9	45.6
trans-1,2-Dichloroethene	ND	57.0	57.1	49.3	47.2
trans-1,3-Dichloropropene	ND	57.0	57.1	54.1	55.0
1,2,3-Trichlorobenzene	ND	57.0	57.1	53.9	51.8
1,1,1-Trichloroethane	ND	57.0	57.1	48.8	47.4
1,1,2-Trichloroethane	ND	57.0	57.1	52.7	53.4
Trichloroethene	ND	57.0	57.1	46.8	44.9
Trichlorofluoromethane	ND	57.0	57.1	49.2	46.5
1,2,3-Trichloropropane	ND	57.0	57.1	55.3	58.1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	57.0	57.1	42.1	40.8
1,3,5-Trimethylbenzene	ND	57.0	57.1	48.0	45.4
1,2,4-Trimethylbenzene	ND	57.0	57.1	48.5	46.3
Vinyl acetate	ND	57.0	57.1	49.5	53.0
Vinyl chloride	ND	57.0	57.1	47.0	44.2
Xylenes, Total	ND	171	171	142	135 F

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

Method Blank - Batch: 560-11358

Method: 8270C

Preparation: 3550B

Lab Sample ID: MB 560-11358/1-AA

Analysis Batch: 560-11401

Instrument ID: Agilent GCMS [Method 8270

Client Matrix: Solid

Prep Batch: 560-11358

Lab File ID: 05140710.D

Dilution: 1.0

Units: ug/Kg

Initial Weight/Volume: 30 g

Date Analyzed: 05/14/2007 1344

Final Weight/Volume: 1 mL

Date Prepared: 05/11/2007 0900

Injection Volume:

Analyte	Result	Qual	MDL	RL
Acenaphthene	ND		50	330
Acenaphthylene	ND		50	330
Anthracene	ND		50	330
Benzo[a]anthracene	ND		50	330
Benzo[a]pyrene	ND		50	330
Benzo[b]fluoranthene	ND		50	330
Benzo[g,h,i]perylene	ND		50	330
Benzo[k]fluoranthene	ND		50	330
Benzyl alcohol	ND		50	330
Bis(2-chloroethoxy)methane	ND		50	330
Bis(2-chloroethyl)ether	ND		37	330
Bis(2-ethylhexyl) phthalate	ND		50	330
4-Bromophenyl phenyl ether	ND		50	330
Butyl benzyl phthalate	ND		50	330
4-Chloroaniline	ND		170	330
4-Chloro-3-methylphenol	ND		50	330
2-Chloronaphthalene	ND		50	330
2-Chlorophenol	ND		28	330
4-Chlorophenyl phenyl ether	ND		50	330
Chrysene	ND		50	330
Dibenz(a,h)anthracene	ND		50	330
Dibenzofuran	ND		50	330
1,3-Dichlorobenzene	ND		44	330
1,4-Dichlorobenzene	ND		46	330
1,2-Dichlorobenzene	ND		52	330
3,3'-Dichlorobenzidine	ND		170	330
2,4-Dichlorophenol	ND		50	330
Diethyl phthalate	ND		50	330
2,4-Dimethylphenol	ND		50	330
Dimethyl phthalate	ND		50	330
Di-n-butyl phthalate	ND		50	330
4,6-Dinitro-2-methylphenol	ND		170	1700
2,4-Dinitrophenol	ND		330	1700
2,6-Dinitrotoluene	ND		50	330
2,4-Dinitrotoluene	ND		170	330
Di-n-octyl phthalate	ND		50	330
Fluoranthene	ND		50	330
Fluorene	ND		50	330
Hexachlorobenzene	ND		50	330
Hexachlorobutadiene	ND		45	330
Hexachlorocyclopentadiene	ND		67	670

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

Method Blank - Batch: 560-11358

Method: 8270C

Preparation: 3550B

Lab Sample ID: MB 560-11358/1-AA

Analysis Batch: 560-11401

Instrument ID: Agilent GCMS [Method 8270

Client Matrix: Solid

Prep Batch: 560-11358

Lab File ID: 05140710.D

Dilution: 1.0

Units: ug/Kg

Initial Weight/Volume: 30 g

Date Analyzed: 05/14/2007 1344

Final Weight/Volume: 1 mL

Date Prepared: 05/11/2007 0900

Injection Volume:

Analyte	Result	Qual	MDL	RL
Hexachloroethane	ND		50	330
Indeno[1,2,3-cd]pyrene	ND		50	330
Isophorone	ND		50	330
2-Methylnaphthalene	ND		31	330
2-Methylphenol	ND		33	330
3 & 4 Methylphenol	ND		50	330
Naphthalene	ND		42	330
2-Nitroaniline	ND		50	330
3-Nitroaniline	ND		170	330
4-Nitroaniline	ND		28	330
Nitrobenzene	ND		36	330
2-Nitrophenol	ND		50	330
4-Nitrophenol	ND		170	1700
N-Nitrosodi-n-propylamine	ND		50	330
N-Nitrosodiphenylamine	ND		50	330
2,2'-oxybis(2-chloropropane)	ND		41	330
Pentachlorophenol	ND		170	1700
Phenanthrene	ND		50	330
Phenol	ND		50	330
Pyrene	ND		50	330
1,2,4-Trichlorobenzene	ND		46	330
2,4,6-Trichlorophenol	ND		50	330
2,4,5-Trichlorophenol	ND		50	330

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	91	45 - 105
2-Fluorophenol	89	35 - 105
Nitrobenzene-d5	83	35 - 100
Phenol-d5	88	40 - 100
Terphenyl-d14	102	30 - 125
2,4,6-Tribromophenol	102	35 - 125

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

Laboratory Control Sample - Batch: 560-11358

Method: 8270C
Preparation: 3550B

Lab Sample ID: LCS 560-11358/2-AA
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/14/2007 1413
Date Prepared: 05/11/2007 0900

Analysis Batch: 560-11401
Prep Batch: 560-11358
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 827
Lab File ID: 05140711.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	3330	2860	86	45 - 110	
Acenaphthylene	3330	2870	86	45 - 105	
Anthracene	3330	2910	87	55 - 105	
Benzo[a]anthracene	3330	3000	90	50 - 110	
Benzo[a]pyrene	3330	2980	89	50 - 110	
Benzo[b]fluoranthene	3330	3160	95	45 - 115	
Benzo[g,h,i]perylene	3330	2960	89	40 - 125	
Benzo[k]fluoranthene	3330	2930	88	45 - 125	
Benzyl alcohol	3330	3170	95	20 - 125	
Bis(2-chloroethoxy)methane	3330	2750	83	45 - 110	
Bis(2-chloroethyl)ether	3330	2480	74	40 - 105	
Bis(2-ethylhexyl) phthalate	3330	2940	88	45 - 125	
4-Bromophenyl phenyl ether	3330	3070	92	45 - 115	
Butyl benzyl phthalate	3330	2980	89	50 - 125	
4-Chloroaniline	3330	1620	49	25 - 125	
4-Chloro-3-methylphenol	3330	3020	91	45 - 115	
2-Chloronaphthalene	3330	2770	83	50 - 120	
2-Chlorophenol	3330	2860	86	45 - 105	
4-Chlorophenyl phenyl ether	3330	3070	92	45 - 110	
Chrysene	3330	2970	89	55 - 110	
Dibenz(a,h)anthracene	3330	3070	92	40 - 125	
Dibenzofuran	3330	2900	87	50 - 105	
1,3-Dichlorobenzene	3330	2470	74	40 - 100	
1,4-Dichlorobenzene	3330	2510	75	35 - 105	
1,2-Dichlorobenzene	3330	2550	77	45 - 95	
3,3'-Dichlorobenzidine	3330	2240	67	25 - 128	
2,4-Dichlorophenol	3330	2970	89	45 - 110	
Diethyl phthalate	3330	3010	90	50 - 115	
2,4-Dimethylphenol	3330	2970	89	30 - 105	
Dimethyl phthalate	3330	3030	91	50 - 110	
Di-n-butyl phthalate	3330	3060	92	55 - 110	
4,6-Dinitro-2-methylphenol	3330	3140	94	30 - 135	
2,4-Dinitrophenol	3330	3200	96	15 - 130	
2,6-Dinitrotoluene	3330	3060	92	50 - 110	
2,4-Dinitrotoluene	3330	3010	90	50 - 115	
Di-n-octyl phthalate	3330	3060	92	40 - 130	
Fluoranthene	3330	3050	91	55 - 115	
Fluorene	3330	2980	89	50 - 110	
Hexachlorobenzene	3330	3090	93	45 - 120	
Hexachlorobutadiene	3330	2700	81	40 - 115	
Hexachlorocyclopentadiene	3330	2400	72	44 - 120	
Hexachloroethane	3330	2400	72	35 - 110	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

Laboratory Control Sample - Batch: 560-11358

Method: 8270C
Preparation: 3550B

Lab Sample ID: LCS 560-11358/2-AA
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/14/2007 1413
Date Prepared: 05/11/2007 0900

Analysis Batch: 560-11401
Prep Batch: 560-11358
Units: ug/Kg

Instrument ID: Agilent GCMS [Method 827
Lab File ID: 05140711.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Indeno[1,2,3-cd]pyrene	3330	3030	91	40 - 120	
Isophorone	3330	2570	77	45 - 110	
2-Methylnaphthalene	3330	2860	86	45 - 105	
2-Methylphenol	3330	2990	90	40 - 105	
3 & 4 Methylphenol	6670	6270	94	40 - 105	
Naphthalene	3330	2650	80	40 - 105	
2-Nitroaniline	3330	2820	85	45 - 120	
3-Nitroaniline	3330	2160	65	25 - 110	
4-Nitroaniline	3330	2790	84	35 - 115	
Nitrobenzene	3330	2540	76	40 - 115	
2-Nitrophenol	3330	2800	84	40 - 110	
4-Nitrophenol	3330	3620	109	15 - 140	
N-Nitrosodi-n-propylamine	3330	2820	84	40 - 115	
N-Nitrosodiphenylamine	3330	2920	88	50 - 115	
2,2'-oxybis(2-chloropropane)	3330	2540	76	20 - 115	
Pentachlorophenol	3330	3100	93	25 - 120	
Phenanthrene	3330	2970	89	50 - 110	
Phenol	3330	2650	80	40 - 100	
Pyrene	3330	2950	88	45 - 125	
1,2,4-Trichlorobenzene	3330	2660	80	45 - 110	
2,4,6-Trichlorophenol	3330	3110	93	45 - 110	
2,4,5-Trichlorophenol	3330	3090	93	50 - 110	

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	88	45 - 105
2-Fluorophenol	88	35 - 105
Nitrobenzene-d5	81	35 - 100
Phenol-d5	91	40 - 100
Terphenyl-d14	104	30 - 125
2,4,6-Tribromophenol	105	35 - 125

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

Method Blank - Batch: 560-11351

Method: TX 1005

Preparation: TX_1005_S_Prep

Lab Sample ID: MB 560-11351/1-AA

Analysis Batch: 560-11387

Instrument ID: Hewlett Packard GC [Methoc

Client Matrix: Solid

Prep Batch: 560-11351

Lab File ID: 05110732.D

Dilution: 1.0

Units: mg/Kg

Initial Weight/Volume: 10.00 g

Date Analyzed: 05/11/2007 1736

Final Weight/Volume: 10.0 mL

Date Prepared: 05/11/2007 1400

Injection Volume:

Analyte	Result	Qual	MDL	RL
>C12-C28	ND		6.0	50
>C28-C35	ND		6.0	50
C6-C12	ND		6.0	50
Total Petroleum Hydrocarbons (C6-C35)	ND		6.0	50

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	93	70 - 130

Laboratory Control/

Laboratory Control Duplicate Recovery Report - Batch: 560-11351

Method: TX 1005

Preparation: TX_1005_S_Prep

LCS Lab Sample ID: LCS 560-11351/2-AA

Analysis Batch: 560-11387

Instrument ID: Hewlett Packard GC

Client Matrix: Solid

Prep Batch: 560-11351

Lab File ID: 05110733.D

Dilution: 1.0

Units: mg/Kg

Initial Weight/Volume: 10.00 g

Date Analyzed: 05/11/2007 1745

Final Weight/Volume: 10.0 mL

Date Prepared: 05/11/2007 1400

Injection Volume:

LCS Lab Sample ID: LCS 560-11351/3-AA	Analysis Batch: 560-11387	Instrument ID: Hewlett Packard GC
Client Matrix: Solid	Prep Batch: 560-11351	Lab File ID: 05110734.D
Dilution: 1.0	Units: mg/Kg	Initial Weight/Volume: 10.04 g
Date Analyzed: 05/11/2007 1753		Final Weight/Volume: 10.0 mL
Date Prepared: 05/11/2007 1400		Injection Volume:

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Total Petroleum Hydrocarbons (C6-C35)	84	92	75 - 125	9	20		
Surrogate	LCS % Rec		LCSD % Rec		Acceptance Limits		
o-Terphenyl	82		88		70 - 130		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

**Laboratory Control/
Laboratory Duplicate Data Report - Batch: 560-11351**

**Method: TX 1005
Preparation: TX_1005_S_Prep**

LCS Lab Sample ID: LCS 560-11351/2-AA Units: mg/Kg
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/11/2007 1745
Date Prepared: 05/11/2007 1400

LCSD Lab Sample ID: LCSD
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/11/2007 1753
Date Prepared: 05/11/2007 1400

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Total Petroleum Hydrocarbons (C6-C35)	250	249	210	230

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 560-11351**

**Method: TX 1005
Preparation: TX_1005_S_Prep**

MS Lab Sample ID: 560-4634-1 Analysis Batch: 560-11387
Client Matrix: Solid Prep Batch: 560-11351
Dilution: 1.0
Date Analyzed: 05/11/2007 1811
Date Prepared: 05/11/2007 1400

Instrument ID: Hewlett Packard GC [Meth
Lab File ID: 05110736.D
Initial Weight/Volume: 10.00 g
Final Weight/Volume: 10.0 mL
Injection Volume:

MSD Lab Sample ID: 560-4634-1 Analysis Batch: 560-11387
Client Matrix: Solid Prep Batch: 560-11351
Dilution: 1.0
Date Analyzed: 05/11/2007 1819
Date Prepared: 05/11/2007 1400

Instrument ID: Hewlett Packard GC [Meth
Lab File ID: 05110737.D
Initial Weight/Volume: 10.00 g
Final Weight/Volume: 10.0 mL
Injection Volume:

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Total Petroleum Hydrocarbons (C6-C35)	102	99	75 - 125	3	20		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
o-Terphenyl	100	98	70 - 130

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

Matrix Spike/ Matrix Spike Duplicate Data Report - Batch: 560-11351

Method: TX 1005
Preparation: TX_1005_S_Prep

MS Lab Sample ID: 560-4634-1 Units: mg/Kg
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/11/2007 1811
Date Prepared: 05/11/2007 1400

MSD Lab Sample ID: 560-4634-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/11/2007 1819
Date Prepared: 05/11/2007 1400

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Total Petroleum Hydrocarbons (C6-C35)	ND	294	294	300	290

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Kleinfelder Inc

Job Number: 560-4634-1

Matrix Duplicate - Batch: 560-11370

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: 560-4634-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/14/2007 0835
Date Prepared: N/A

Analysis Batch: 560-11370
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Percent Moisture	15	15.4	4	20	
Percent Solids	85	84.6	1	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

STL Corpus Christi
1733 N. Padre Island Drive
Corpus Christi, TX 78408

No. 007767

13.1 IR
just sampled once

CHAIN OF CUSTODY RECORD

[illegible]

STL Corpus Christi is a part of Severn Trent Laboratories, Inc.

STL-8222-CC (0700)

LOGIN SAMPLE RECEIPT CHECK LIST

Client: Kleinfelder Inc

Job Number: 560-4634-1

Login Number: 4634

Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	NA	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	JUST SAMPLED
Cooler Temperature is recorded.	True	13.1C IR 1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	NA	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

No. 007767

CHAIN OF CUSTODY RECORD

CUSTOMER INFORMATION				PROJECT INFORMATION					
COMPANY:		KLEINFELDER		PROJECT NAME/NUMBER:		FALCON / 59752			
SEND REPORT TO:		STEVE HALASZ		BILLING INFORMATION					
ADDRESS:		3601 MANOR ROAD		BILL TO:		KLEINFELDER			
AUSTIN, TX 78723				ADDRESS:		3601 MANOR ROAD			
PHONE:		512 926 6650		AUSTIN, TX 78723					
FAX:		512 926 3312		PHONE:		512 926 6650			
				FAX:		512 926 3312 PO NO.:			
SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	CONTAINER	PRESERV.	ANALYSIS/METHOD REQUEST VOCs SVOCs TPH	LAB JOB NO. <div>4634</div>	REMARKS/PRECAUTIONS
Floor 1	TAN SAND	5-11-07	09:30		9 OZ				
SAMPLER: PAUL SUPAK				SHIPMENT METHOD:				AIRBILL NO.:	
REQUIRED TURNAROUND* <input type="checkbox"/> SAME DAY <input checked="" type="checkbox"/> 24 HOURS <input type="checkbox"/> 48 HOURS <input type="checkbox"/> 72 HOURS <input type="checkbox"/> 5 DAYS <input type="checkbox"/> 10 DAYS <input type="checkbox"/> ROUTINE <input type="checkbox"/> OTHER _____									
1. RELINQUISHED BY:		DATE	2. RELINQUISHED BY:		DATE	3. RELINQUISHED BY:		DATE	
SIGNATURE: Paul Supak		TIME: 10:45	SIGNATURE:			SIGNATURE:			
PRINTED NAME/COMPANY: Paul Supak / KLEINFELDER		TIME: 5/11/07	PRINTED NAME/COMPANY:		TIME	PRINTED NAME/COMPANY:		TIME	
1. RECEIVED BY:		DATE	2. RECEIVED BY:		DATE	3. RECEIVED BY:		DATE	
SIGNATURE: [Signature]		TIME: 05/11/07	SIGNATURE:			SIGNATURE:			
PRINTED NAME/COMPANY: [Signature] SR		TIME: 10:45	PRINTED NAME/COMPANY:		TIME	PRINTED NAME/COMPANY:		TIME	

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STL-8222-CC (0700)

*RUSH TURNAROUND MAY REQUIRE SURCHARGE

PHOTOS



Photograph No. 1

Area 1, with current barge dock facility in the background.

Photograph No. 2

Area 3 – Ten pipelines exposed.



Photograph No. 3

Area 4 excavation



Photograph No. 4

Impacted soil prior to pipeline cutting

Photograph No. 5

Excavation is vacuumed out.



Photograph No. 6

Pipelines are cut and excavation is vacuumed out.



Photograph No. 7

Impacted soil placed temporarily on plastic liner.

Photograph No. 8

Impacted sediment placed in roll off boxes.



Photograph No. 9

Pipelines are jetted clean.



Photograph No. 10

Fluid is vacuumed while jetting is performed.

Photograph No. 11

Pipelines are capped.



Photograph No. 12

Soil is covered pending waste disposal.

FIGURE

APPENDIX H

Appendix H
Comparison of Quantitation Limits to Ecological Screening Standards

Analyte	Data Group	CAS	Bioaccumulative	AQUEOUS		WATER				SOLID		SEDIMENT				SOIL					
				RL ug/L	MDL ug/L	FRESHWATER ug/l	MARINE ug/l	MDL>TCEQ FRESHWATER	MDL>TCEQ MARINE	RL ug/kg	MDL ug/kg	FRESHWATER ug/kg dry wt.	MARINE ug/kg dry wt.	MDL>TCEQ FRESHWATER	MDL>TCEQ MARINE	EARTHWORMS mg/kg dry wt.	PLANTS mg/kg dry wt.	MEDIAN BACKGROUND mg/kg dry wt.			
Acetone	VOC	67-64-1	No	50	2.8	101,200	b	282000.00	b	No	No	50	7.2	60030		167230.0		No	No		
Benzene	VOC	71-43-2	No	2	0.23	130	e	109.00	g	No	No	5	1.4	160		140.0		No	No		
Bromobenzene	VOC	108-86-1	No	2	0.73	NA		NA		NA	NA	5	1.3	NA		NA		NA	NA		
Bromochloromethane	VOC	74-97-5	No	2	0.64	NA		NA		NA	NA	5	1.4	NA		NA		NA	NA		
Bromodichloromethane	VOC	75-27-4	No	2	0.33	2,160	b	NA		No	NA	5	1.4	2460		NA		No	No		
Bromoform	VOC	75-25-2	No	2	0.65	149	b	1220.00	b	NA	NA	5	1.2	220		1780.0		No	No		
n-Butylbenzene	VOC	104-51-8	No	2	0.6	36	b	NA		No	NA	5	0.97	1090		NA		No	NA		
sec-Butylbenzene	VOC	135-98-8	No	2	0.5	41	b	NA		No	NA	5	1.1	880		NA		No	NA		
tert-Butylbenzene	VOC	98-06-6	No	2	0.55	48	b	NA		No	NA	5	1	1210		NA		No	NA		
Chlorobenzene	VOC	108-90-7	No	2	0.54	64	e	105.00	g	No	No	5	1.4	170		290.0		No	No	40	
Chloroethane	VOC	75-00-3	No	2	0.46	NA		NA		NA	NA	5	1.4	NA		NA		NA	NA		
Chloroform	VOC	67-66-3	No	2	0.66	890	q	4100.00	q	No	No	5	1.3	940		4300.0		No	No		
o-Chlorotoluene	VOC	95-49-8	No	2	0.5	NA		NA		NA	NA	5	1.2	NA		NA		NA	NA		
p-Chlorotoluene	VOC	106-43-4	No	2	0.5	NA		NA		NA	NA	5	1.1	NA		NA		NA	NA		
Carbon Disulfide	VOC	75-15-0	No	2	0.62	105	b	NA		No	NA	10	1.3	120		NA		No	NA		
Carbon tetrachloride	VOC	56-23-5	No	2	0.52	10	e	1500.00	g	No	No	10	1.3	20		3670.0		No	No		
Dibromochloromethane	VOC	124-48-1	No	2	0.68	129		NA		NA	NA	5	1.4	160		NA		No	NA		
1,2-Dibromo-3-chloropropane	VOC	96-12-8	No	2	1.5	NA		NA		NA	NA	5	1.4	NA		NA		NA	NA		
1,2-Dibromoethane	VOC	106-93-4	No	2	0.68	NA		NA		NA	NA	5	1.4	NA		NA		NA	NA		
1,1-Dichloroethane	VOC	75-34-3	No	2	0.52	2,570	q	NA		No	NA	5	1.3	2320		NA		No	NA		
1,2-Dichloroethane	VOC	107-06-2	No	2	0.53	6,300	q	5650.00	q	No	No	5	1.4	4790		4300.0		No	No		
1,1-Dichloroethylene	VOC	75-35-4	No	2	0.68	1,500	q	12500.00	q	No	No	5	1.3	1870		15410.0		No	No		
cis-1,2-Dichloroethylene	VOC	156-59-2	No	2	0.83	NA		NA		NA	NA	5	1.4	NA		NA		NA	NA		
trans-1,2-Dichloroethylene	VOC	156-60-5	No	2	0.75	22,000	q	NA		No	NA	5	1.3	23950		NA		No	NA		
1,2-Dichloropropane	VOC	78-87-5	No	2	0.59	1,870	b	2400.00	g	No	No	5	1.5	2200		2820.0		No	NA	700	
1,3-Dichloropropane	VOC	142-28-9	No	2	0.61	NA		NA		NA	NA	5	1.4	NA		NA		NA	NA		
2,2-Dichloropropane	VOC	594-20-7	No	2	0.65	NA		NA		NA	NA	5	1.1	NA		NA		NA	NA		
1,1-Dichloropropene	VOC	563-58-6	No	2	0.38	NA		NA		NA	NA	5	1.2	NA		NA		NA	NA		
cis-1,3-Dichloropropene	VOC	10061-01-5	No	2	0.59	NA		NA		NA	NA	5	1.3	NA		NA		NA	NA		
trans-1,3-Dichloropropene	VOC	10061-02-6	No	2	0.61	NA		NA		NA	NA	5	1.4	NA		NA		NA	NA		
m-Dichlorobenzene	VOC	541-73-1	No	2	0.5	85	b	142.00	b	No	No	5	1.2	190		320.0		No	No		
o-Dichlorobenzene	VOC	95-50-1	No	2	0.5	110	b	99.00	b	No	No	5	1.2	830		740.0		No	No		
p-Dichlorobenzene	VOC	106-46-7	No	2	0.5	110	b	99.00	b	No	No	5	1.2	770		700.0		No	No	20	
Dichlorodifluoromethane	VOC	75-71-8	No	2	0.73	1,960	b	NA		No	NA	5	1.1	3680		NA		No	NA		
1-4-Dioxane	VOC	123-91-1	No	50	24.1	22,000	x	NA	b	No	NA	250	24	119	x	NA		No	NA	12.6	NA
Ethyl benzene	VOC	100-41-4	No	2	0.48	1,090	b	249.00	b	No	No	5	1.3	2860		650.0		No	No		
2-Hexanone	VOC	591-78-6	No	10	1.9	6,130	b	NA		No	NA	50	6.8	4700		NA		No	NA		
Hexachlorobutadiene	VOC	87-68-3	No	2	1.8	1	g	0.32	g	Yes	Yes	5	1.2	55		20.0		No	No		
Isopropylbenzene	VOC	98-82-8	No	2	0.46	255	b	NA		NA	NA	5	1.2	8990		NA		No	NA		
p-Isopropyltoluene	VOC	99-87-6	No	2	0.57	42	b	NA		NA	NA	5	1.2	1000		NA		No	NA		
Methyl bromide	VOC	74-83-9	No	2	0.47	110	b	600.00	b	No	No	5	1.5	80		420.0		No	No		
Methyl chloride	VOC	74-87-3	No	2	0.6	28,000	b	13500.00	b	NA	NA	5	1.5	106800		52430.0		No	No		
4-Methyl-2-pentanone	VOC	108-10-1	No	10	7.3	26,400	b	61500.00	b	No	No	50	7	19430		45340.0		No	No		
Methylene bromide	VOC	74-95-3	No	2	1	NA		NA		NA	NA	5	2	NA		NA		NA	NA		
Methylene chloride	VOC	75-09-2	No	5	0.67	11,000	q	5420.00	q	No	No	10	2.5	7750		3820.0		No	No		
Methyl ethyl ketone	VOC	78-93-3	No	10	3	42,400	b	NA		NA	NA	50	6.7	25710		NA		No	NA		
Naphthalene	VOC	91-20-3	No	5	0.57	250	b	125.00	b	NA	NA	5	1.2	176		160.0		No	No		
n-Propylbenzene	VOC	103-65-1	No	2	0.53	64	b	NA		No	NA	5	1.1	720		NA		No	NA		
Styrene	VOC	100-42-5	No	2	0.5	1,250	b	455.00	b	No	No	5	1.3	10240		3720.0		No	No	300	
1,1,1,2-Tetrachloroethane	VOC	630-20-6	No	2	0.52	NA		NA		NA	NA	5	1.4	NA		NA		NA	NA		
1,1,2,2-Tetrachloroethane	VOC	79-34-5	No	2	0.46	465	b	451.00	b	No	No	5	1.4	630		610.0		No	No		
1,2,3-Trichlorobenzene	VOC	87-61-6	No	2	0.62	NA		NA		NA	NA	5	1.2	NA		NA		NA	NA	20	

Appendix H
Comparison of Quantitation Limits to Ecological Screening Standards

Analyte	Data Group	CAS	Bioaccumulative	AQUEOUS		WATER						SOLID		SEDIMENT						SOIL		
				RL ug/L	MDL ug/L	FRESHWATER ug/l	MARINE ug/l	MDL>TCEQ FRESHWATER	MDL>TCEQ MARINE	RL ug/kg	MDL ug/kg	FRESHWATER ug/kg dry wt.	MARINE ug/kg dry wt.	MDL>TCEQ FRESHWATER	MDL>TCEQ MARINE	EARTHWORMS mg/kg dry wt.	PLANTS mg/kg dry wt.	MEDIAN BACKGROUND mg/kg dry wt.				
1,2,4-Trichlorobenzene	VOC	120-82-1	No	2	0.93	51	b	22.00	b	No	No	5	1	880		390.0		No	No	20		
1,1,1-Trichloroethane	VOC	71-55-6	No	2	0.37	2,450	q	1560.00	q	No	No	5	1.2	4130		2630.0		No	No			
1,1,2-Trichloroethane	VOC	79-00-5	No	2	0.66	900	b	275.00	b	No	No	5	1.4	980		300.0		No	No			
Trichloroethylene	VOC	79-01-6	No	2	0.63	550	b	970.00	q	No	No	5	1.3	840		1470.0		No	No			
Trichlorofluoromethane	VOC	75-69-4	No	2	0.82	871	b	NA		No	NA	5	1	1690		NA		No	NA			
1,2,3-Trichloropropane	VOC	96-18-4	No	2	0.52	NA		NA		NA	NA	5	1.4	NA		NA		NA	NA			
1,2,4-Trimethylbenzene	VOC	95-63-6	No	2	0.55	77	b	217.00	b	No	No	5	1.1	760		2160.0		No	No			
1,3,5-Trimethylbenzene	VOC	108-67-8	No	2	0.47	71	b	NA		No	NA	5	1.1	770		NA		No	NA			
Tetrachloroethylene	VOC	127-18-4	No	2	0.74	790	q	1450.00	q	No	No	5	1.3	1690		3100.0		No	No			
Toluene	VOC	108-88-3	No	2	0.54	1,450	q	480.00	q	No	No	5	1.3	2880		940.0		No	No		200	
Vinyl Acetate	VOC	108-05-4	No	10	2.1	2,820	b	NA		No	NA	25	8	10	b	NA		No	NA	12.7		
Vinyl chloride	VOC	75-01-4	No	2	0.32	2,820	b	NA		No	NA	5	1.4	1960		NA		No	NA			
Xylene (Total)	VOC	1330-20-7	No	6	1.1	1,340	q	850.00	q	No	No	15	3.8	4000		2540.0		No	No			
m,p-Xylene	VOC	108-38-3	No	4	1.1	2	e,m	NA		No	NA	5	1.3	4.6		NA		No	NA			
o-Xylene	VOC	95-47-6	No	2	0.48	NA		NA		NA	NA	5	1.3	NA		NA		NA	NA			
Acenaphthene	SVOC	83-32-9	No	5.0	2.4	23	o	40.40	o	No	No	170	43	6.7	J	16.0		Yes	Yes		20	
Acenaphthylene	SVOC	208-96-8	No	5.0	1.6	4,840	x	NA		NA	NA	170	42	5.9	J	44.0		Yes	No			
Anthracene	SVOC	120-12-7	No	5.0	2.1	0.3	b	0.18	b	Yes	Yes	170	49	57.2		85.3		No	No			
Benzenethiol	SVOC	108-98-5	No	10.0	10.0	NA		NA		NA	NA	170	170	NA		NA		NA	NA			
Benzo(a)anthracene	SVOC	56-55-3	No	5.0	1.1	35	b	NA		No	NA	170	43	108		261.0		No	No			
Benzo(a)pyrene	SVOC	50-32-8	No	5.0	1.3	0.014	e	NA		Yes	NA	170	41	150		430.0		No	No			
Benzo(b)fluoranthene	SVOC	205-99-2	No	5.0	2.9	9.1	x	NA		NA	NA	170	43	NA		NA		NA	NA			
Benzo(g,h,i)perylene	SVOC	191-24-2	No	5.0	1.2	7.6	x	NA		NA	NA	170	68	NA		NA		NA	NA			
Benzo(k)fluoranthene	SVOC	207-08-9	No	5.0	0.94	9.04	x	NA		NA	NA	170	40	NA		NA		NA	NA			
Benzoic acid	SVOC	65-85-0	No	50	5.0	9,000	b	NA		No	NA	830	830	NA		NA		NA	NA			
Benzyl alcohol	SVOC	100-51-6	No	5.0	1.3	9	e	NA		No	NA	170	56	NA		NA		NA	NA			
bis(2-Chloroethoxy)methane	SVOC	111-91-1	No	5.0	1.1	NA		NA		NA	NA	170	46	NA		NA		NA	NA			
bis(2-Chloroethyl)ether	SVOC	111-44-4	No	5.0	1.4	12,000	b	NA		No	NA	170	45	NA		NA		NA	NA			
bis(2-Ethylhexyl)phthalate	SVOC	117-81-7	No	5.0	1.6	300	a,r	NA		No	NA	170	100	182	D	182.0	D	No	No			
4-Bromophenyl-phenyl ether	SVOC	101-55-3	No	5.0	3.2	2	e,m	NA		Yes	NA	170	37	NA		NA		NA	NA			
Butyl benzyl phthalate	SVOC	85-68-7	No	5.0	1.3	93	b	147.00	b	No	No	170	71	NA		NA		NA	NA			
Carbazole	SVOC	86-74-8	No	5.0	2.0	NA		NA		NA	NA	170	47	NA		NA		NA	NA			
4-Chloroaniline	SVOC	106-47-8	No	5.0	1.7	NA		NA		NA	NA	170	48	NA		NA		NA	NA			
4-Chloro-3-methyl phenol	SVOC	59-50-7	No	5.0	0.91	0.3	g	NA		Yes	NA	170	46	NA		NA		NA	NA			
2-Chloronaphthalene	SVOC	91-58-7	No	5.0	1.5	54	b	NA		No	NA	170	51	NA		NA		NA	NA			
2-Chlorophenol	SVOC	95-57-8	No	5.0	2.1	130	b	265.00	b	No	No	170	33	NA		NA		NA	NA			
4-Chlorophenyl phenyl ether	SVOC	7005-72-3	No	5.0	1.9	NA		NA		NA	NA	170	34	NA		NA		NA	NA			
Chrysene	SVOC	218-01-9	No	5.0	1.6	7	b	NA		No	NA	170	64	166		384.0		No	No			
Cyclohexanediol	SVOC	6995-79-5 931-71-5	No	NA	NA	NA		NA		NA	NA	NA	NA	NA		NA		NA	NA			
Dibenz(a,h)acridine	SVOC	226-36-8	No	5.0	4.8	54	e	NA		No	NA	170	61	NA		NA		NA	NA			
Dibenzo(a,h)anthracene	SVOC	53-70-3	No	5.0	1.6	5	b	NA		No	NA	170	61	33		63.4		Yes	No			
Dibenzofuran	SVOC	132-64-9	No	5.0	0.99	94	b	65.00	b	No	No	170	33	NA		NA		NA	NA			
1,2-Dichlorobenzene	SVOC	95-50-1	No	5.0	2.6	110	b	99.00	b	No	No	170	69	830		740.0		No	No			
1,3-Dichlorobenzene	SVOC	541-73-1	No	5.0	3.1	85	b	142.00	b	No	No	170	31	190		320.0		No	No			
1,4-Dichlorobenzene	SVOC	106-46-7	No	5.0	2.5	110	b	99.00	b	No	No	170	39	770		700.0		No	No			
3,3'-Dichlorobenzidine	SVOC	91-94-1	No	10	1.3	53	b	37.00	b	No	No	330	81	NA		NA		NA	NA			
2,4-Dichlorophenol	SVOC	120-83-2	No	5.0	1.0	85	b	NA		No	NA	170	30	NA		NA		NA	NA			
Diethylphthalate	SVOC	84-66-2	No	5.0	5.0	1,040	b	442.00	b	No	No	170	39	630	M	NA		No	NA		100	
7,12-Dimethyben(a)anthracene	SVOC	57-97-6	No	5.0	4.8	NA		NA		NA	NA	170	170	NA		NA		NA	NA			
2,4-Dimethylphenol	SVOC	105-67-9	No	5.0	1.2	105	b	NA		No	NA	170	54	NA		NA		NA	NA			
Dimethyl phthalate	SVOC	131-11-3	No	5.0	1.2	330	g	580.00	g	No	No	170	39	NA		NA		NA	NA		200	
Di-n-butyl phthalate	SVOC	84-74-2	No	5.0	1.7	7	b	5.00	b	No	No	170	44	NA		NA		NA	NA		200	
4,6-Dinitro-o-cresol	SVOC	534-52-1	No	10	3.7	12	b	NA		No	NA	330	81	NA		NA		NA	NA			
2,4-Dinitrophenol	SVOC	51-28-5	No	25	2.0	31	b	670.00	b	No	No	830	46	NA		NA		NA	NA		20	
2,4-Dinitrotoluene	SVOC	121-14-2	No	5.0	1.5	1,220	b	NA		No	NA	170	49	NA		NA		NA	NA			
2,6-Dinitrotoluene	SVOC	606-20-2	No	5.0	1.4	NA		NA		NA	NA	170	46	NA		NA		NA	NA			
Di-n-octylphthalate	SVOC	117-84-0	No	5.0	1.3	22	b	NA		No	NA	170	60	NA		NA		NA	NA			
Fluoranthene	SVOC	206-44-0	No	5.0	1.2	6	o	2.96	o	No	No	170	38	423		600.0		No	No			
Fluorene	SVOC	86-73-7	No	5.0	0.96	11	b	50	b	No	No	170	37	77.4		19.0		No	Yes		30	
Hexachlorobenzene	SVOC	118-74-1	Yes: F, M, Sed, Soil	5.0	3.3	0.0003	x	NA		NA	NA	170	47	20	B	NA		NA	NA			

Appendix H
Comparison of Quantitation Limits to Ecological Screening Standards

Analyte	Data Group	CAS	Bioaccumulative	AQUEOUS		WATER					SOLID		SEDIMENT					SOIL		
				RL ug/L	MDL ug/L	FRESHWATER ug/l	MARINE ug/l	MDL>TCEQ FRESHWATER	MDL>TCEQ MARINE		RL ug/kg	MDL ug/kg	FRESHWATER ug/kg dry wt.	MARINE ug/kg dry wt.	MDL>TCEQ FRESHWATER	MDL>TCEQ MARINE		EARTHWORMS mg/kg dry wt.	PLANTS mg/kg dry wt.	MEDIAN BACKGROUND mg/kg dry wt.
Hexachlorobutadiene	SVOC	87-68-3	No	5.0	4.0	0.93	g	0.32	g	Yes	Yes	170	60	55	K	20.0		Yes	Yes	
Hexachlorocyclopentadiene	SVOC	77-47-4	No	5.0	4.0	0.07	b	0.07	g	Yes	Yes	170	58	NA		NA		NA	NA	10
Hexachloroethane	SVOC	67-72-1	No	5.0	4.0	12	e,m	9.40	g	No	No	170	48	230		180.0		No	No	
Indene	SVOC	95-13-6	No	15	13	NA		NA		NA	NA	830	830	NA		NA		NA	NA	
Indeno(1,2,3-cd)pyrene	SVOC	193-39-5	No	5.0	1.2	4.3	x	NA		NA	NA	170	66	NA		NA		NA	NA	
Isophorone	SVOC	78-59-1	No	5.0	0.89	6,000	b	650	b	No	No	170	43	NA		NA		NA	NA	
Methyl Chrysene	SVOC	1705-85-7	No	5.0	4.8	NA		NA		NA	NA	170	170	NA		NA		NA	NA	
1-Methylnaphthlene	SVOC	90-12-0	No	5.0	1.5	2	e	NA		NA	NA	170	36	NA		NA		NA	NA	
2-Methylnaphthalene	SVOC	91-57-6	No	5.0	2.6	63	b	30.00	b	No	No	170	37	NA		70.0		NA	No	
2-Methylphenol	SVOC	95-48-7	No	5.0	1.1	560	b	510	b	No	No	170	75	NA		NA		NA	NA	
3-Methylphenol	SVOC	108-39-4	No	5.0	2.0	272	b	510	b											
4-Methylphenol	SVOC	106-44-5	No	5.0	2.0	272	b	NA		NA	NA	170	38	NA		NA		NA	NA	
Naphthalene	SVOC	91-20-3	No	5.0	1.5	250	b	125.00	b	No	No	170	28	176		160.0		No	No	
N-Diphenylamine	SVOC	122-39-4	No	NA	NA	NA		NA		NA	NA	NA	NA	NA		NA		NA	NA	
2-Nitroaniline	SVOC	88-74-4	No	5.0	1.4	NA		NA		NA	NA	170	70	NA		NA		NA	NA	
3-Nitroaniline	SVOC	99-09-2	No	5.0	1.6	NA		NA		NA	NA	170	43	NA		NA		NA	NA	
4-Nitroaniline	SVOC	100-01-6	No	5.0	1.7	NA		NA		NA	NA	170	170	NA		NA		NA	NA	
Nitrobenzene	SVOC	98-95-3	No	5.0	0.86	270	g	66.80	g	No	No	170	50	510		130.0		No	No	40
4-Nitrophenol	SVOC	100-02-7	No	25	1.3	532	b	359.00	b	No	No	170	120	NA		NA		NA	NA	7
N-Nitroso-di-n-propylamine	SVOC	621-64-7	No	5.0	1.1	20	b	120.00	b	No	No	170	76	NA		NA		NA	NA	
N-Nitrosodiphenylamine	SVOC	86-30-6	No	5.0	1.4	290	b	165000.00	b	No	No	170	69	NA		NA		NA	NA	20
Pentachlorophenol	SVOC	87-86-5	Yes: Sed, Soil	25	1.6	2	c,p	9.60	c	No	No	830	89	NA		NA		NA	NA	31 ^{54,515}
Phenanthrene	SVOC	85-01-8	No	5.0	2.0	30	c	4.60	c	No	No	170	36	204		240.0		No	No	
Phenol	SVOC	108-95-2	No	5.0	0.51	110	n	2750.00	b	No	No	170	53	NA		NA		NA	NA	30
1-Phenylethanol	SVOC	NA	No	NA	NA	NA		NA		NA	NA	NA	NA	NA		NA		NA	NA	70
Pyrene	SVOC	129-00-0	No	5.0	1.3	7	b	0.24	b	No	Yes	170	73	195		665		No	No	
Low MW PAHs	SVOC	NA	No	5.0	1.3	NA		NA		NA	NA	170	73	NA		552	b	No	No	
High MW PAHs	SVOC	NA	No	5.0	1.3	NA		NA		NA	NA	170	73	NA		1700	b	No	No	
Total PAHs	SVOC	NA	No	5.0	1.3	NA		NA		NA	NA	170	73	4000	b	4022	b	No	Yes	
Quinoline	SVOC	91-22-5	No	5.0	5.0	2	b	NA		Yes	NA	170	170	NA		NA		NA	NA	
1,2,4-Trichlorobenzene	SVOC	120-82-1	No	5.0	2.9	51	b	22.00	b	No	No	170	40	880		390.0		No	No	20
2,4,5-Trichlorophenol	SVOC	95-95-4	No	5.0	1.8	64	c	12.00	c	No	No	170	67	NA		NA		NA	No	9
2,4,6-Trichlorophenol	SVOC	88-06-2	No	5.0	1.2	14	b	61.00	b	No	No	170	46	NA		NA		NA	No	10
Aldrin	Pest	309-00-2	Yes: Sed, Soil	0.050	0.014	0.3	c,k	0.13	c,k	No	No	1.7	0.40	2	B	NA		No	No	
alpha-Chlordane	Pest	5103-71-9	Yes: Sed, Soil	NA	NA	NA		NA		NA	NA	NA	NA	NA		NA		NA	No	
alpha-BHC	Pest	319-84-6	Yes: Sed, Soil	0.050	0.012	74	b	25.00	b	No	No	1.7	0.36	6	B	NA		No	No	
beta-BHC	Pest	319-85-7	Yes: Sed, Soil	0.050	0.0080	83	b	NA		No	NA	1.7	0.53	5	B	NA		No	NA	
Chlordane (technical)	Pest	12789-03-6	Yes: Sed, Soil	0.50	0.19	NA		NA		NA	NA	17	2.3	NA		NA		NA	NA	
4,4'-DDD	Pest	72-54-8	Yes: F, M, Sed, Soil	0.10	0.015	0.01	e	0.03	g	Yes	No	3.3	0.96	4.88	E	1.2	E	No	No	
4,4'-DDE	Pest	72-55-9	Yes: F, M, Sed, Soil	0.10	0.017	11	g	0.14	g	No	No	3.3	1.3	3.16	E	2.1	E	No	No	
4,4'-DDT	Pest	50-29-3	Yes: F, M, Sed, Soil	0.10	0.013	0.001	c	0.001	c	Yes	Yes	3.3	1.5	4.16	E	1.2	E	No	Yes	
delta-BHC	Pest	319-86-8	Yes: Sed, Soil	0.050	0.015	141	b	NA		No	NA	1.7	0.53	NA		NA		NA	NA	
Dieldrin	Pest	60-57-1	Yes: Sed, Soil	0.10	0.013	0.002	c	0.002	c	Yes	Yes	3.3	0.89	1.9		0.7	D	No	Yes	
Endosulfan I	Pest	959-98-8	No	0.10	0.0080	0.056	c	0.01	c	No	No	3.3	0.46	NA		NA		NA	NA	
Endosulfan II	Pest	33213-65-9	No	0.10	0.013	0.056	c	0.01	c	No	Yes	3.3	0.83	NA		NA		NA	NA	
Endosulfan sulfate	Pest	1031-07-8	No	0.10	0.014	0.056	c	0.01	c	No	Yes	3.3	0.96	NA		NA		NA	NA	
Endrin	Pest	72-20-8	Yes: Sed, Soil	0.10	0.019	0.002	c	0.002	c	Yes	Yes	3.3	1.1	2.22		NA		No	NA	
Endrin aldehyde	Pest	7421-93-4	Yes: Sed, Soil	0.10	0.017	1,210	b	NA		No	No	3.3	1.4	NA		NA		NA	NA	
gamma-BHC (Lindane)	Pest	58-89-9	Yes: Sed, Soil	0.050	0.0070	0.08	c	0.02	c,k	No	No	1.7	0.73	2.37		0.3	D	No	Yes	
gamma-Chlordane	Pest	5103-74-2	Yes: Sed, Soil	NA	NA	NA		NA		NA	NA	NA	NA	NA		NA		NA	NA	
Heptachlor	Pest	76-44-8	Yes: Sed, Soil	0.050	0.010	0.004	c	0.004	c	Yes	Yes	1.7	0.46	NA		NA		NA	NA	
Heptachlor epoxide	Pest	1024-57-3	Yes: Sed, Soil	0.050	0.0060	0.0038	a	0.004	a	Yes	Yes	1.7	0.33	2.47		NA		No	NA	
Methoxychlor	Pest	72-43-5	No	0.50	0.078	0.03	c	0.03	c	Yes	Yes	17	7.2	NA		NA		NA	NA	
Toxaphene	Pest	8001-35-2	Yes: Sed, Soil	0.50	0.20	0.0002	c	0.0002	c	Yes	Yes	17	12	0.1	K	NA		Yes	NA	
Aroclor-1016	PCB	12674-11-2	Yes: F, M, Sed, Soil	0.50	0.50	NA		NA		NA	NA	17	11	7	B	NA		Yes	NA	
Aroclor-1221	PCB	11104-28-2	Yes: F, M, Sed, Soil	0.50	0.50	NA		NA		NA	NA	17	17	NA		NA		NA	NA	
Aroclor-1232	PCB	11141-16-5	Yes: F, M, Sed, Soil	0.50	0.34	NA		NA		NA	NA	17	9.6	NA		NA		NA	NA	
Aroclor-1242	PCB	53469-21-9	Yes: F, M, Sed, Soil	0.50	0.16	NA		NA		NA	NA	17	14	NA		NA		NA	NA	
Aroclor-1248	PCB	12672-29-6	Yes: F, M, Sed, Soil	0.50	0.37	NA		NA		NA	NA	17	13	30	B	NA		No	NA	
Aroclor-1254	PCB	27323-18-8	Yes: F, M, Sed, Soil	0.50	0.17	NA		NA		NA	NA	17	14	60	B	NA		No	NA	

Appendix H
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Analyte	Data Group	CAS	Bioaccumulative	AQUEOUS		WATER					SOLID		SEDIMENT					SOIL		
				RL ug/L	MDL ug/L	FRESHWATER ug/l	MARINE ug/l	MDL>TCEQ FRESHWATER	MDL>TCEQ MARINE		RL ug/kg	MDL ug/kg	FRESHWATER ug/kg dry wt.	MARINE ug/kg dry wt.	MDL>TCEQ FRESHWATER	MDL>TCEQ MARINE		EARTHWORMS mg/kg dry wt.	PLANTS mg/kg dry wt.	MEDIAN BACKGROUND mg/kg dry wt.
Aroclor-1260	PCB	11096-82-5	Yes: F, M, Sed, Soil	0.50	0.23	NA		NA		NA	17	6.9	5	B	NA		Yes	NA		
Total PCBs	PCB	1336-36-3	Yes: F, M, Sed, Soil	1.00	0.5	0	b	0.03	b	Yes	33	17	59.8	b	22.7	b	No	No	40	
2,4-D	Herb	94-75-7	No	1.5	0.80	NA		NA		NA	33	13	NA		NA		NA	NA		
2,4-DB	Herb	94-82-6	No	2.0	1.9	NA		NA		NA	66	54	NA		NA		NA	NA		
Dalapon	Herb	75-99-0	No	1.0	1.0	NA		NA		NA	33	23	NA		NA		NA	NA		
Dicamba	Herb	1918-00-9	No	0.20	0.080	NA		NA		NA	6.6	5.0	NA		NA		NA	NA		
Dichloroprop	Herb	120-36-5	No	1.0	0.51	NA		NA		NA	33	8.9	NA		NA		NA	NA		
Dinoseb	Herb	88-85-7	No	0.20	0.090	NA		NA		NA	6.6	4.3	NA		NA		NA	NA		
MCPA	Herb	94-74-6	No	50	NA	NA		NA		NA	170	NA	NA		NA		NA	NA		
MCCP	Herb	93-65-2	No	50	NA	NA		NA		NA	170	NA	NA		NA		NA	NA		
Pentachlorophenol	Herb	87-86-5	Yes: Sed, Soil	0.050	0.040	2	c,p	9.60	c	NA	1.7	0.99	NA		NA		NA	NA	31 ^{56,515}	5 ⁵¹⁵
2,4,5-T	Herb	93-76-5	No	0.20	0.12	NA		NA		NA	6.6	3.3	NA		NA		NA	NA		
2,4,5-TP (Silvex)	Herb	93-72-1	No	0.20	0.15	NA		NA		NA	13	12	NA		NA		NA	NA		
Aluminum	Metals	7429-90-5	No	200	55.3	87	a	NA		No	200	25.6	NA		NA		NA	NA		30,000
Antimony	Metals	7440-36-0	No	5.0	1.8	160	g	NA		No	10	5.1	2000	A	NA		No	NA	78 ^{55,56}	5
Arsenic (d)	Metals	7440-38-2	No	5.0	2.7	190	c,w	78.00	c,w	No	10	1.7	9790		8200.0		No	No	60	18 ⁵¹³
Barium	Metals	7440-39-3	No	200	3.0	16,000	b	25000.00	b	No	200	2.6	NA		NA		NA	NA	330 ^{56,58}	500
Beryllium	Metals	7440-41-7	No	5.0	0.06	5	b	NA		No	5	0.2	NA		NA		NA	NA	40 ^{56,59}	10
Cadmium	Metals	7440-43-9	Yes: Sed, Soil	5.0	0.24	1	c,f	10.00	c,w	No	5	0.3	990		1200.0		No	No	140 ^{56,510}	32 ⁵¹⁰
Calcium	Metals	7440-70-2	No	5000	134.89	NA		NA		NA	5000	73.3	NA		NA		NA	NA		
Chromium	Metals	7440-47-3	Tri: No -- Hex: Yes-soil	10	1.82	NA		NA		NA	10	0.9	43400		81000.0		No	No	0.4	1
Chromium (Hex) (d)	Metals	18540-29-9	Yes: Soil	10	4	11	c,w	49.60	c,w	No	2	2	NA		NA		No	NA		30
Chromium (Tri) (d)	Metals	16065-83-1	No	3000	NA	101	c,f	103.00	g		3000	NA								
Cobalt	Metals	7440-48-4	No	50	0.99	1,500	b	NA		No	50	0.8	50000	B	NA		No	NA		13 ⁵¹¹
Copper (d)	Metals	7440-50-8	Yes: Sed, Soil	25	1.42	7	c,h,w	3.60	c,h,w	No	25	5.4	31600		34000.0		No	No	61 ^{56,57}	100
Iron	Metals	7439-89-6	No	100	18.97	1,000	a	NA		No	100	40.5	20000000	B	NA		No	NA		15,000
Lead (d)	Metals	7439-92-1	Yes; Soil	3	0.7	1	c,f	5.30	c,w	No	10	1.2	35800		46700.0		No	No	1700 ⁵¹⁴	120 ^{56,514}
Magnesium	Metals	7439-95-4	No	5000	16.8	3,230	b	NA		No	5000	61.5	NA		NA		NA	NA		
Manganese	Metals	7439-96-5	No	15	7.68	120	e	NA		No	15	9.6	460000	B	NA		No	NA		500
Mercury	Metals	7439-97-6	Yes: F, M, Sed, Soil	0.2	NA	1	c	1.10	c	No			180		150.0		No	No	0.1	0.3
Nickel (d)	Metals	7440-02-0	Yes: Sed, Soil	40	1.0	87	c,f	13.10	c,w	No	40	1.4	22700		20900.0		No	No	200	30
Potassium	Metals	7440-09-7	No	5000	125.2	NA		NA		NA	5000	169.5	NA		NA		NA	NA		
Selenium	Metals	7782-49-2	Yes: F, M, Sed, Soil	5	3.2	5	c	136.00	c	No	10	2.7	NA		NA		NA	NA		0.3
Silver (d)	Metals	7440-22-4	No	10	0.5	0.1	a,f,k	0.19	a,k	Yes	10	1.0	1000	A	1000.0		No	No		2
Sodium	Metals	7440-23-5	No	5000	292	NA		NA		NA	5000	51.8	NA		NA		NA	NA		
Thallium	Metals	7440-28-0	Yes: F, M	10	1.5	4	g	21.30	g	No	20	5.3	NA		NA		NA	NA		1
Vanadium	Metals	7440-62-2	No	50	0.4	20	e	NA		No	50	1.1	NA		NA		NA	NA		0.7
Zinc (d)	Metals	7440-66-6	Yes: Sed, Soil	20	7.5	58	c,f	84.20	c,w	No	20	6.2	121000		150000.0		No	No		2
Cyanide (free)	Metals	57-12-5	No	NA	NA	11	c,i	5.6	c,i	NA	NA	NA	NA		NA		NA	NA	120 ^{56,57}	190 ⁵⁷

Note: All Benchmark and Bioaccumulative values were obtained from TCEQ 2006 RG-263, unless otherwise noted.

RL = Reporting Limit.

MDL= Minimum Detection Limit

TCEQ = Texas Commission on Environmental Quality

a U.S. EPA, 2002.
b TCEQ 2003a. In-house water quality chronic values derived for wastewater permits and requests from the Office of Waste based on LC50 values in accordance with methodology defined in the TSWQS. Water Quality Division.
c Texas Surface Water Quality Standards Chronic (unless otherwise noted) Criteria (30 TAC §307.6, Table 1, Effective August 17, 2000).
d Indicates that the criteria for a specific parameter are for the dissolved portion in water.
e Tier II Secondary Chronic Values from Suter and Tsao (1996).
f Criteria calculated using a hardness value of 50 mg/L. See formula for standard that follows.
g U.S. EPA Region 4. 2001. Value derived from Region 4 Water Quality Management Division screening worksheet.
h In designated oyster waters an acute saltwater copper criterion of 3.6 micrograms per liter applies outside of the mixing zone of permitted discharges, and specified mixing zones for copper will not encompass oyster reefs containing live oysters.
i Compliance will be determined using the analytical method for cyanide amenable to chlorination or by weak acid dissociable cyanide.
j Based on the procedure defined in TCEQ (2003), the percent dissolved silver that is in the free ionic form is estimated from the following regression equation: $Y = \exp [\exp (1/ (0.6559 + 0.0044(Cl)))]$ where, Y = % of dissolved silver that is in free ionic form, and Cl = dissolved chloride concentration (mg/l). Persons should use the 50th percentile chloride value (from TCEQ, 2003) for the nearest downstream segment unless site-specific data is available.
k There is only an acute criterion (no chronic criterion). The indicated value is the acute criterion divided by 10.
l State of Colorado hardness-based water quality standard (Colorado Department of Public Health and Environment, 2005).
m Values calculated for OSWER 1996 as provided in Suter and Tsao (1996).
n Value calculated using Great Lakes Water Quality Initiative Tier I methodology (U.S. EPA,1993a) as provided in Suter and Tsao (1996).
o These numbers are FCVs calculated by the EPA for use in the derivation of the sediment quality criteria (U.S. EPA, 1993b, c).
p Criteria calculated using a pH of 6.0. See formula for standard that follows.
q Value derived by work group using the LC50 approach discussed in Section 3.5.1.1. Contact the TCEQ Technical Support Section (Remediation Division) for a full discussion of each value.
r According to U.S. EPA, 2002, bis(2-ethylhexyl)phthalate is not toxic to aquatic organisms at or below its solubility limit. Benchmark set at solubility limit given at TRRP Figure 30 TAC §350.73 (e)
w Indicates that the criterion is multiplied by a water-effects ratio in order to incorporate the effects of local water chemistry on toxicity. The water-effects ratio is equal to 1 except where sufficient data is available to establish a site-specific, water-effects ratio. Water-effects ratios for individual water bodies are listed in Appendix E of the TSWQS.
x USEPA, 2003, Region 5 Ecological Screening Levels (ESLs) for RCRA Appendix IX Hazardous Constituents (available at <http://www.epa.gov/reg5rcra/ca/ESL.pdf>)

A Effects Range Low (ERL) from: Long, E.R. and L.G. Morgan. 1990. The Potential for Biological Effects of Sediment-sorbed Contaminants Tested in the National Status and Trends Program. NOAA Technical Memorandum NOS OMA 52, March 1990.
B Lowest Effects Level (LEL) from: Persaud, D., R. Jaagumagi and A. Hayton. 1993. Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario. Water Resources Branch. Ontario Ministry of the Environment and Energy. August.
C No “c” footnotes.
D Threshold Effects Level (TEL) from: Smith, S.L., D.D. MacDonald, K.A. Keenleyside, and C.L. Gaudet. 1996b. The Development and Implementation of Canadian Sediment Quality Guidelines.In: Development and Progress in Sediment Quality Assessment: Rationale, Challenges, Techniques & Strategies. Ecovision World Monograph Series. Munawar & Dave (Eds.). Academic Publishing, Amsterdam, The Netherlands.
E When benchmarks represent the sum of individual compounds, isomers, or groups of congeners, and the chemical analysis indicates an undetected value, the proxy value specified at §350.51 (n) shall be used for calculating the sum of the respective compounds, isomers, or congeners. This assumes that the particular COC has not been eliminated in accordance with the criteria at §350.71 (k).
F The low molecular weight PAH benchmark is to be compared to the sum of the concentrations of the following compounds: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, and 2-methyl naphthalene. The PAH benchmark is not the sum of the corresponding benchmarks listed for the individual compounds.
G The high molecular weight PAH benchmark is to be compared to the sum of the concentrations of the following compounds: fluoranthene, pyrene, benz(a)anthracene, chrysene, benzo(a)pyrene, and dibenzo [a,h]anthracene. The PAH benchmark is not the sum of the corresponding benchmarks listed for the individual compounds.
H Total PAH refers to the sum of the concentrations of each of low and high molecular weight PAHs listed above and any other PAH compounds that are not eliminated in accordance with §350.71 (k).
I The benchmarks for total PAHs are the most relevant in evaluating risk in an ERA as PAHs almost always occur as mixtures. Values for individual, low molecular weight, and high molecular weight PAHs are provided as guidelines to aid in the determination of disproportionate concentrations within the mixture that may be masked by the total. See discussion in Section 3.5.4.
J CCME (Canadian Council of Ministers of the Environment). 1999. Canadian environmental quality guidelines. Winnipeg, Manitoba.
K NYSDEC (New York State Department of Environmental Conservation). 1999. Technical guidance for screening contaminated sediments. Division of Fish , Wildlife, and Marine Resources. Albany, New York. 36 pp.
L Stortelder, P.B., M.A. Vandergaag, and L.A. van der Kooij. 1989. Perspectives for water organisms. An ecotoxicological basis for quality objectives for water and sediment. Part1. Results and calculations. DBW/RIZA Memorandum N. 89.016a. (English Version August, 1991). Institute for Inland Water Management and Waste Water Treatment. Lelystad, Netherlands.
M U.S. EPA. 1997. The incidence and severity of sediment contamination in surface waters of the United States. Volume 1: National sediment quality survey. EPA 823-R-97-006. Office of Science and Technology (4305). Washington, District of Columbia
N Benchmarks derived using formula in: Fuchsman, P.C. 2003. Modification of the Equilibrium Partitioning Approach for Volatile Organic Compounds in Sediment. Environ Toxicol Chem. 22:1532-1534. TCEQ Surface water values from Table 3-2 were used for water quality values. TRRP-24 default values of 1% fraction organic carbon (foc) and 0.37 porosity were used. The person should adjust these values if sufficient site-specific data indicate they are not representative.

S1 Efroymson, R.A., M.E. Will, and G.W. Suter. 1997. Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision. Lockheed Martin Energy Systems, Inc. ES/ER/TM-126/R2.
S2 Efroymson, R.A., M.E. Will, G.W. Suter, and A.C. Wooten. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. Lockheed Martin Energy Systems, Inc. ES/ER/TM-85/R3.
S3 Texas-Specific Median Background Concentration (Figure 30 TAC §350.51(m)).
S4 Potential ecological risks associated with aluminum in soils is identified based on the measured soil pH. Where aluminum is a COC, it should only be retained for those soils with a soil pH less than 5.5. Source: U.S. Environmental Protection Agency. Ecological Soil Screening Level for Aluminum. Interim Final. OSWER Directive 9285.7-60. November 2003.
S5 U.S. EPA. Ecological Soil Screening Level for Antimony. Interim Final. OSWER Directive 9285.7-61. February 2005.
S6 Screening values for soil invertebrates.
S7 U.S. EPA. 2000. Ecological Soil Screening Level Guidance. Draft. Office of Emergency and Remedial Response. July 10, 2000.
S8 U.S. EPA. Ecological Soil Screening Levels for Barium. Interim Final. OSWER Directive 9285.7-63. February 2005.
S9 U.S. EPA. Ecological Soil Screening Levels for Beryllium. Interim Final. OSWER Directive 9285.7-64. February 2005.
S10 U.S. EPA. Ecological Soil Screening Levels for Cadmium. Interim Final. OSWER Directive 9285.7-65. March 2005.
S11 U.S. EPA. Ecological Soil Screening Levels for Cobalt. Interim Final. OSWER Directive 9285.7-67. March 2005.
S12 Iron is not expected to be toxic to plants in well-aerated soils between pH 5 and 8. Iron’s relative importance is not so much based on its direct chemical toxicity, but its effect as a mediator in the geochemistry of other potentially toxic metals and the potential hazard of depositing flocculent. Source: U.S. Environmental Protection Agency. Ecological Soil Screening Level for Iron. Interim Final. OSWER Directive 9285.7-69. November 2003.
S13 U.S. EPA. Ecological Soil Screening Levels for Arsenic. Interim Final. OSWER Directive 9285.7-62. March 2005.
S14 U.S. EPA. Ecological Soil Screening Levels for Lead. Interim Final. OSWER Directive 9285.7- 70. March 2005.
S15 U.S. EPA. Ecological Soil Screening Levels for Pentachlorophenol. Interim Final. OSWER Directive 9285.7-58. March 2005.

APPENDIX I

Appendix I
Comparison of Quantitation Limits to EPA Region 6 Human Health MSSLs and TCEQ Tier 1 PCLs

Analyte	Data Group	CAS	AQUEOUS		EPA Region 6 MSSL	TCEQ PCL ³	EPA 6 Tap Water MDL>MSSL	TCEQ Groundwater PCL MDL>PCL	MCL ug/L	SOLID		EPA Region 6 MSSL	TCEQ PCL ³	EPA 6 Res Soil MDL>MSSL	TCEQ Res Soil MDL>PCL
			RL ug/L	MDL ug/L	Tap Water ug/l	^{GW} GW _{ING} (Res) ug/l				RL ug/kg	MDL ug/kg	Residential ug/kg	Residential ug/kg		
Acetone	VOC	67-64-1	50	2.8	5475.0	21997.8	No	No	NA	50	7.2	14150596.1	5417410.6	No	No
Benzene	VOC	71-43-2	2	0.23	0.4	5.0	No	No	5.0	5	1.4	655.7	19456.3	No	No
Bromobenzene	VOC	108-86-1	2	0.73	23.3	488.8	No	No	NA	5	1.3	72591.5	79103.9	No	No
Bromochloromethane	VOC	74-97-5	2	0.64	NA	977.7	NA	No	NA	5	1.4	NA	352307.1	NA	No
Bromodichloromethane	VOC	75-27-4	2	0.33	0.2	14.7	Yes	No	NA	5	1.4	1026.0	97947.3	No	No
Bromoform	VOC	75-25-2	2	0.65	8.5	115.5	No	No	NA	5	1.2	61568.9	276174.4	No	No
Butanol	VOC	71-36-3	10	TBD	3650.0	2444.2	TBD	TBD	NA	10	TBD	6110309.7	1774338.4	TBD	TBD
n-Butylbenzene	VOC	104-51-8	2	0.6	60.8	977.7	No	No	NA	5	0.97	144897.9	1491317.0	No	No
sec-Butylbenzene	VOC	135-98-8	2	0.5	60.8	977.7	No	No	NA	5	1.1	111615.2	1550923.2	No	No
tert-Butylbenzene	VOC	98-06-6	2	0.55	60.8	977.7	No	No	NA	5	1	131672.5	1398509.4	No	No
Chlorobenzene	VOC	108-90-7	2	0.54	91.3	100.0	No	No	100.0	5	1.4	273175.4	318098.1	No	No
Chloroethane	VOC	75-00-3	2	0.46	3.9	9776.8	No	No	NA	5	1.4	3032.2	23152959.6	No	No
Chloroform	VOC	67-66-3	2	0.66	0.2	244.4	Yes	No	NA	5	1.3	245.5	8009.6	No	No
o-Chlorotoluene	VOC	95-49-8	2	0.5	121.7	488.8	No	No	NA	5	1.2	158713.8	828812.6	No	No
p-Chlorotoluene	VOC	106-43-4	2	0.5	NA	488.8	NA	No	NA	5	1.1	NA	2468.2	NA	No
Carbon Disulfide	VOC	75-15-0	2	0.62	1042.9	2444.2	No	No	NA	10	1.3	721254.2	3299872.6	No	No
Carbon tetrachloride	VOC	56-23-5	2	0.52	0.2	5.0	Yes	No	5.0	10	1.3	240.0	9724.7	No	No
Cyclohexane	VOC	110-82-7	2	0.53	12514.3	122209.8	No	No	NA	5	1.2	142803.5	42459498.0	No	No
Dibromochloromethane	VOC	124-48-1	2	0.68	0.1	10.9	Yes	No	NA	5	1.4	1010.7	72294.4	No	No
1,2-Dibromo-3-chloropropane	VOC	96-12-8	2	1.5	2.E-04	0.2	Yes	Yes	NA	5	1.4	2.6	3176.5	No	No
1,2-Dibromoethane	VOC	106-93-4	2	0.68	5.6E-03	0.1	Yes	Yes	NA	5	1.4	28.3	427.9	No	No
1,1-Dichloroethane	VOC	75-34-3	2	0.52	1216.7	4888.4	No	No	NA	5	1.3	845964.5	2647618.4	No	No
1,2-Dichloroethane	VOC	107-06-2	2	0.53	0.1	5.0	Yes	No	5.0	5	1.4	346.6	6405.4	No	No
1,1-Dichloroethylene	VOC	75-35-4	2	0.68	338.8	7.0	No	No	7.0	5	1.3	284897.7	1139605.9	No	No
cis-1,2-Dichloroethylene	VOC	156-59-2	2	0.83	60.8	70.0	No	No	70.0	5	1.4	43028.1	724256.7	No	No
trans-1,2-Dichloroethylene	VOC	156-60-5	2	0.75	106.8	100.0	No	No	100.0	5	1.3	121799.6	1298324.1	No	No
1,2-Dichloropropane	VOC	78-87-5	2	0.59	0.2	5.0	Yes	No	5.0	5	1.5	351.3	31446.1	No	No
1,3-Dichloropropane	VOC	142-28-9	2	0.61	NA	9.1	NA	No	NA	5	1.4	NA	26191.7	NA	No
2,2-Dichloropropane	VOC	594-20-7	2	0.65	NA	13.4	NA	No	NA	5	1.1	NA	31446.1	NA	No
1,1-Dichloropropene	VOC	563-58-6	2	0.38	NA	9.1	NA	No	NA	5	1.2	NA	26191.7	NA	No
cis-1,3-Dichloropropene	VOC	10061-01-5	2	0.59	NA _a	1.7	NA	No	NA	5	1.3	NA _a	7092.0	NA	No
trans-1,3-Dichloropropene	VOC	10061-02-6	2	0.61	NA _a	9.1	NA	No	NA	5	1.4	NA _a	26191.7	NA	No
m-Dichlorobenzene	VOC	541-73-1	2	0.5	14.5	733.3	No	No	NA	5	1.2	68534.2	61578.7	No	No
o-Dichlorobenzene	VOC	95-50-1	2	0.5	49.3	600.0	No	No	600.0	5	1.2	278923.4	388654.9	No	No
p-Dichlorobenzene	VOC	106-46-7	2	0.5	0.47	75.0	Yes	No	75.0	5	1.2	3197.5	253030.5	No	No
Dichlorodifluoromethane	VOC	75-71-8	2	0.73	394.6	4888.4	No	No	NA	5	1.1	94077.3	11542289.8	No	No
1-4-Dioxane	VOC	123-91-1	50	24.1	6.1	83.0	Yes	No	NA	250	24	44216.4	552066.5	No	No
Ethyl benzene	VOC	100-41-4	2	0.48	1339.9	700.0	No	No	700.0	5	1.3	233948.1	4019946.3	No	No
Ethyl ether	VOC	60-29-7	10	TBD	1216.7	4888.4	TBD	TBD	NA	10	TBD	1840994.9	6034014.1	TBD	TBD
2-Hexanone	VOC	591-78-6	10	1.9	NA	1466.5	NA	No	NA	50	6.8	NA	55994.5	NA	No
Hexachlorobutadiene	VOC	87-68-3	2	1.8	0.9	4.9	Yes	No	NA	5	1.2	6235.7	11989.6	No	No
Hexane	VOC	110-54-3	2	0.61	1454.7	1466.5	No	No	NA	5	1.1	114726.7	2601170.5	No	No
Isopropylbenzene	VOC	98-82-8	2	0.46	658.2	2444.2	No	No	NA	5	1.2	370838.9	3008694.4	No	No
p-Isopropyltoluene	VOC	99-87-6	2	0.57	NA	2444.2	NA	No	NA	5	1.2	NA	2466497.4	NA	No
Methyl bromide	VOC	74-83-9	2	0.47	8.7	34.2	No	No	NA	5	1.5	3904.5	29365.7	No	No
Methyl chloride	VOC	74-87-3	2	0.6	2.1	70.2	No	No	NA	5	1.5	1261.1	83952.1	No	No
4-Methyl-2-pentanone	VOC	108-10-1	10	7.3	1990.9	1955.4	No	No	NA	50	7	5797292.3	5369829.7	No	No
Methylene bromide	VOC	74-95-3	2	1	60.8	121.7	No	No	NA	5	2	141209.1	135377.6	No	No
Methylene chloride	VOC	75-09-2	5	0.67	4.3	5.0	No	No	5.0	10	2.5	8898.2	264109.7	No	No
Methyl ethyl ketone	VOC	78-93-3	10	3	7064.5	14665.2	No	No	NA	50	6.7	32089642.9	26778603.3	No	No
Naphthalene	VOC	91-20-3	5	0.57	6.2	488.8	No	No	NA	5	1.2	124797.8	124097.0	No	No
n-Propylbenzene	VOC	103-65-1	2	0.53	60.8	977.7	No	No	NA	5	1.1	144897.9	1631815.1	No	No

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Comparison of Quantitation Limits to EPA Region 6 Human Health MSSLs and TCEQ Tier 1 PCLs

Analyte	Data Group	CAS	AQUEOUS		EPA Region 6 MSSL	TCEQ PCL ³	EPA 6 Tap Water MDL>MSSL	TCEQ Groundwater PCL MDL>PCL	MCL ug/L	SOLID		EPA Region 6 MSSL	TCEQ PCL ³	EPA 6 Res Soil MDL>MSSL	TCEQ Res Soil MDL>PCL
			RL ug/L	MDL ug/L	Tap Water ug/l	^{GW} GW _{ING} (Res) ug/l				RL ug/kg	MDL ug/kg	Residential ug/kg	Residential ug/kg		
Styrene	VOC	100-42-5	2	0.5	1641.1	100.0	No	No	100.0	5	1.3	1733844.5	7034948.3	No	No
1,1,1,2-Tetrachloroethane	VOC	630-20-6	2	0.52	0.4	35.1	Yes	No	NA	5	1.4	3005.2	38852.9	No	No
1,1,2,2-Tetrachloroethane	VOC	79-34-5	2	0.46	0.06	4.6	Yes	No	NA	5	1.4	384.3	3990.6	No	No
1,2,3-Trichlorobenzene	VOC	87-61-6	2	0.62	NA	73.3	NA	No	NA	5	1.2	NA	187647.9	NA	No
1,2,4-Trichlorobenzene	VOC	120-82-1	2	0.93	8.2	70.0	No	No	70.0	5	1	142520.2	613085.2	No	No
1,1,1-Trichloroethane	VOC	71-55-6	2	0.37	835.8	200.0	No	No	200.0	5	1.2	1385377.7	5327386.2	No	No
1,1,2-Trichloroethane	VOC	79-00-5	2	0.66	0.2	5.0	Yes	No	5.0	5	1.4	844.2	10390.9	No	No
Trichloroethylene	VOC	79-01-6	2	0.63	0.03	5.0	Yes	No	5.0	5	1.3	42.6	90584.7	No	No
Trichlorofluoromethane	VOC	75-69-4	2	0.82	1288.2	7332.6	No	No	NA	5	1	386624.0	11636629.1	No	No
1,2,3-Trichloropropane	VOC	96-18-4	2	0.52	0.002	0.1	Yes	Yes	NA	5	1.4	1.4	867.5	No	No
1,2,4-Trimethylbenzene	VOC	95-63-6	2	0.55	12.4	1222.1	No	No	NA	5	1.1	52145.0	67892.6	No	No
1,3,5-Trimethylbenzene	VOC	108-67-8	2	0.47	12.3	1222.1	No	No	NA	5	1.1	21298.2	58654.3	No	No
Tetrachloroethylene	VOC	127-18-4	2	0.74	0.1	5.0	Yes	No	5.0	5	1.3	554.3	85388.0	No	No
Toluene	VOC	108-88-3	2	0.54	2281.2	1000.0	No	No	1000.0	5	1.3	521170.3	5619322.8	No	No
Vinyl acetate	VOC	108-05-4	10	2.1	412.4	24442.0	No	No	NA	10	7.6	426630.4	1549173.6	No	No
Vinyl chloride	VOC	75-01-4	2	0.32	0.015	2.0	Yes	No	2.0	5	1.4	43.0	3392.4	No	No
Xylenes (Total)	VOC	1330-20-7	6	1.1	202.8	10000.0	No	No	10000.0	15	3.8	214480.3	753215.6	No	No
Acenaphthene	SVOC	83-32-9	5.0	2.4	365.0	1466.5	No	No	NA	170	43	3683396.2	2965473.2	No	No
Acenaphthylene	SVOC	208-96-8	5.0	1.6	NA	1466.5	NA	No	NA	170	42	NA	3781512.6	No	No
Anthracene	SVOC	120-12-7	5.0	2.1	1825.0	7332.6	No	No	NA	170	49	21899671.9	17744113.3	No	No
Benzenethiol	SVOC	108-98-5	10.0	10.0	NA	0.24	NA	Yes	NA	170	170	NA	678.3	NA	No
Benzo(a)anthracene	SVOC	56-55-3	5.0	1.1	0.029	1.3	Yes	No	NA	170	43	147.6	5645.3	No	No
Benzo(a)pyrene	SVOC	50-32-8	5.0	1.3	0.003	0.2	Yes	Yes	0.2	170	41	14.8	563.7	Yes	No
Benzo(b)fluoranthene	SVOC	205-99-2	5.0	2.9	0.029	1.3	Yes	Yes	NA	170	43	147.6	5708.2	No	No
Benzo(g,h,i)perylene	SVOC	191-24-2	5.0	1.2	NA	733.3	NA	No	NA	170	68	NA	1780340.6	No	No
Benzo(k)fluoranthene	SVOC	207-08-9	5.0	0.94	0.29	12.5	Yes	No	NA	170	40	1476.2	57210.1	No	No
Benzoic acid	SVOC	65-85-0	50	5.0	146000.0	97767.9	No	No	NA	830	830	100000000.0	354150.2	No	No
Benzyl alcohol	SVOC	100-51-6	5.0	1.3	10950.0	12221.0	No	No	NA	170	56	18330929.1	4042348.8	No	No
bis(2-Chloroethoxy)methane	SVOC	111-91-1	5.0	1.1	NA	0.83	NA	Yes	NA	170	46	NA	2461.5	NA	No
bis(2-Chloroethyl)ether	SVOC	111-44-4	5.0	1.4	0.0098	0.83	Yes	Yes	NA	170	45	211.2	1382.1	No	No
bis(2-Ethylhexyl)phthalate	SVOC	117-81-7	5.0	1.6	4.8	6.0	No	No	6.0	170	100	34741.5	43157.7	No	No
4-Bromophenyl-phenyl ether	SVOC	101-55-3	5.0	3.2	NA	6.1E-05	NA	Yes	NA	170	37	NA	268.4	NA	No
Butyl benzyl phthalate	SVOC	85-68-7	5.0	1.3	7300.0	4888.4	No	No	NA	170	71	240476.9	5723309.2	No	No
Carbazole	SVOC	86-74-8	5.0	2.0	3.4	45.6	No	No	NA	170	47	24319.0	234921.0	No	No
4-Chloroaniline	SVOC	106-47-8	5.0	1.7	146.0	97.8	No	No	NA	170	48	244412.4	195675.0	No	No
4-Chloro-3-methyl phenol	SVOC	59-50-7	5.0	0.91	NA	122.2	NA	No	NA	170	46	NA	326638.2	NA	No
2-Chloronaphthalene	SVOC	91-58-7	5.0	1.5	486.7	1955.4	No	No	NA	170	51	3855748.3	5042016.8	No	No
2-Chlorophenol	SVOC	95-57-8	5.0	2.1	30.4	122.2	No	No	NA	170	33	63511.2	363515.3	No	No
4-Chlorophenyl phenyl ether	SVOC	7005-72-3	5.0	1.9	NA	0.061	NA	Yes	NA	170	34	NA	153.7	NA	No
Chrysene	SVOC	218-01-9	5.0	1.6	2.9	125.0	No	No	NA	170	64	14761.9	560116.5	No	No
Cyclohexanediol	SVOC	556-48-9	TBD	TBD	NA	NA	NA	NA	NA	TBD	TBD	NA	NA	NA	NA
Dibenz(a,h)acridine	SVOC	226-36-8	5.0	4.8	NA	0.76	NA	Yes	NA	170	61	NA	3692.7	NA	No
Dibenzo(a,h)anthracene	SVOC	53-70-3	5.0	1.6	0.0029	0.2	Yes	Yes	NA	170	61	14.8	549.4	Yes	No
Dibenzofuran	SVOC	132-64-9	5.0	0.99	12.2	97.8	No	No	NA	170	33	145284.4	266261.4	No	No
1,2-Dichlorobenzene	SVOC	95-50-1	5.0	2.6	49.3	600.0	No	No	600.0	170	69	278923.4	388654.9	No	No
1,3-Dichlorobenzene	SVOC	541-73-1	5.0	3.1	14.5	733.3	No	No	NA	170	31	68534.2	61578.7	No	No
1,4-Dichlorobenzene	SVOC	106-46-7	5.0	2.5	0.47	75.0	Yes	No	75.0	170	39	3197.5	253030.5	No	No
3,3'-Dichlorobenzidine	SVOC	91-94-1	10	1.3	0.15	2.0	Yes	No	NA	330	81	1080.8	10440.9	No	No
2,4-Dichlorophenol	SVOC	120-83-2	5.0	1.0	109.5	73.3	No	No	NA	170	30	183309.3	194020.4	No	No
Diethylphthalate	SVOC	84-66-2	5.0	5.0	29200.0	19553.6	No	No	NA	170	39	48882477.6	1424363.1	No	No
7,12-Dimethyben(a)anthracene	SVOC	57-97-6	5.0	4.8	NA	0.0037	NA	Yes	NA	170	170	NA	16.8	NA	Yes
2,4-Dimethylphenol	SVOC	105-67-9	5.0	1.2	730.0	488.8	No	No	NA	170	54	1222061.9	879830.6	No	No
Dimethyl phthalate	SVOC	131-11-3	5.0	1.2	365000.0	19553.6	No	No	NA	170	39	100000000.0	659274.3	No	No
Di-n-butyl phthalate	SVOC	84-74-2	5.0	1.7	3650.0	2444.2	No	No	NA	170	44	6110309.7	4397430.8	No	No
4,6-Dinitro-o-cresol	SVOC	534-52-1	10	3.7	NA	48.9	NA	No	NA	330	81	NA	20500.5	NA	No
2,4-Dinitrophenol	SVOC	51-28-5	25	2.0	73.0	48.9	No	No	NA	830	46	122206.2	133130.7	No	No
2,4-Dinitrotoluene	SVOC	121-14-2	5.0	1.5	73.0	1.3	No	Yes	NA	170	49	122206.2	6909.4	No	No
2,6-Dinitrotoluene	SVOC	606-20-2	5.0	1.4	36.5	1.3	No	Yes	NA	170	46	61103.1	6909.4	No	No
Di-n-octylphthalate	SVOC	117-84-0	5.0	1.3	NA	488.8	NA	No	NA	170	60	NA	1282522.8	NA	No

Appendix I
Comparison of Quantitation Limits to EPA Region 6 Human Health MSSLs and TCEQ Tier 1 PCLs

Analyte	Data Group	CAS	AQUEOUS		EPA Region 6 MSSL Tap Water ug/l	TCEQ PCL ³ GW ^{GW} GW _{ING} (Res) ug/l	EPA 6 Tap Water MDL>MSSL	TCEQ Groundwater PCL MDL>PCL	MCL ug/L	SOLID		EPA Region 6 MSSL Residential ug/kg	TCEQ PCL ³ Residential ug/kg	EPA 6 Res Soil MDL>MSSL	TCEQ Res Soil MDL>PCL
			RL ug/L	MDL ug/L						RL ug/kg	MDL ug/kg				
Fluoranthene	SVOC	206-44-0	5.0	1.2	1460.0	977.7	No	No	NA	170	38	2293610.2	2316431.5	No	No
Fluorene	SVOC	86-73-7	5.0	0.96	243.3	977.7	No	No	NA	170	37	2644485.7	2262903.9	No	No
Hexachlorobenzene	SVOC	118-74-1	5.0	3.3	0.042	1.0	Yes	Yes	1.0	170	47	304.0	1019.9	No	No
Hexachlorobutadiene	SVOC	87-68-3	5.0	4.0	0.9	4.9	Yes	No	NA	170	60	6235.7	11989.6	No	No
Hexachlorocyclopentadiene	SVOC	77-47-4	5.0	4.0	219.0	50.0	No	No	50.0	170	58	365487.5	7160.1	No	No
Hexachloroethane	SVOC	67-72-1	5.0	4.0	4.8	24.4	No	No	NA	170	48	34741.5	66565.3	No	No
Indene	SVOC	95-13-6	15	13	NA	488.8	NA	No	NA	830	830	NA	55695.7	NA	No
Indeno(1,2,3-cd)pyrene	SVOC	193-39-5	5.0	1.2	0.029	1.3	Yes	No	NA	170	66	147.6	5720.9	No	No
Isophorone	SVOC	78-59-1	5.0	0.89	70.8	960.5	No	No	NA	170	43	511979.5	1249295.3	No	No
Methyl Chrysene	SVOC	1705-85-7	5.0	4.8	NA	12.5	NA	No	NA	170	170	NA	56938.2	NA	No
1-Methylnaphthlene	SVOC	90-12-0	5.0	1.5	NA	1710.9	NA	No	NA	170	36	NA	4411764.7	NA	No
2-Methylnaphthalene	SVOC	91-57-6	5.0	2.6	NA	97.8	NA	No	NA	170	37	NA	252100.8	NA	No
2-Methylphenol	SVOC	95-48-7	5.0	1.1	1825.0	1222.1	No	No	NA	170	75	3055154.9	1012583.1	No	No
3-Methylphenol	SVOC	108-39-4	5.0	2.0	1825.0	1222.1	No	No	NA	170	38	3055154.9	1050593.6	No	No
4-Methylphenol	SVOC	106-44-5	5.0	2.0	182.5	122.2	No	No	NA	170	38	305515.5	271029.5	No	No
Naphthalene	SVOC	91-20-3	5.0	1.5	6.2	488.8	No	No	NA	170	28	124797.8	124097.0	No	No
N-Diphenylamine	SVOC	122-39-4	5.0	1.4	912.5	611.0	No	No	NA	170	70	1527577.4	899065.1	No	No
2-Nitroaniline	SVOC	88-74-4	5.0	1.4	109.5	7.3	No	No	NA	170	70	182745.2	10999.4	No	No
3-Nitroaniline	SVOC	99-09-2	5.0	1.6	NA	7.3	NA	No	NA	170	43	NA	19139.5	NA	No
4-Nitroaniline	SVOC	100-01-6	5.0	1.7	NA	24.0	NA	No	NA	170	170	NA	121473.9	NA	No
Nitrobenzene	SVOC	98-95-3	5.0	0.86	3.4	12.2	No	No	NA	170	50	19661.7	29851.0	No	No
4-Nitrophenol	SVOC	100-02-7	25	1.3	292.0	48.9	No	No	NA	170	120	488824.8	51175.6	No	No
N-Nitroso-di-n-propylamine	SVOC	621-64-7	5.0	1.1	0.0096	0.13	Yes	Yes	NA	170	76	69.5	399.8	Yes	No
N-Nitrosodiphenylamine	SVOC	86-30-6	5.0	1.4	13.7	186.2	No	No	NA	170	69	99261.3	571115.7	No	No
Pentachlorophenol	SVOC	87-86-5	25	1.6	0.56	1.0	Yes	Yes	1.0	830	89	2979.0	2417.2	No	No
Phenanthrene	SVOC	85-01-8	5.0	2.0	NA	733.3	NA	No	NA	170	36	NA	1705202.8	No	No
Phenol	SVOC	108-95-2	5.0	0.51	10950.0	7332.6	No	No	NA	170	53	18331473.2	1586133.6	No	No
1-Phenylethanol	SVOC	98-85-1	TBD	TBD	NA	NA	NA	NA	NA	TBD	TBD	NA	NA	NA	NA
Pyrene	SVOC	129-00-0	5.0	1.3	182.5	733.3	No	No	NA	170	73	2308755.7	1697614.5	No	No
1,2,4-Trichlorobenzene	SVOC	120-82-1	5.0	2.9	8.2	70.0	No	No	70.0	170	40	142520.2	613085.2	No	No
2,4,5-Trichlorophenol	SVOC	95-95-4	5.0	1.8	3650.0	2444.2	No	No	NA	170	67	6110309.7	4137518.0	No	No
2,4,6-Trichlorophenol	SVOC	88-06-2	5.0	1.2	6.1	83.0	No	No	NA	170	46	44216.4	300264.4	No	No
Quinoline	SVOC	91-22-5	5.0	5.0	0.022	0.3	Yes	Yes	NA	170	170	162.1	1566.1	Yes	No
Aldrin	Pest	309-00-2	0.050	0.014	0.004	0.054	Yes	No	NA	1.7	0.40	28.6	49.7	No	No
alpha-Chlordane	Pest	5103-71-9	5.0	0.8	NA	2.6	NA	No	NA	170	27	NA	12767.3	NA	No
alpha-BHC	Pest	319-84-6	0.050	0.012	0.011	0.14	Yes	No	NA	1.7	0.36	90.2	251.2	No	No
beta-BHC	Pest	319-85-7	0.050	0.0080	0.037	0.51	No	No	NA	1.7	0.53	315.8	917.2	No	No
Chlordane (technical)	Pest	12789-03-6	0.50	0.19	NA	2.0	NA	No	NA	17	2.3	NA	5928.5	NA	No
4,4'-DDD	Pest	72-54-8	0.10	0.015	0.28	3.8	No	No	NA	3.3	0.96	2436.6	14215.6	No	No
4,4'-DDE	Pest	72-55-9	0.10	0.017	0.2	2.7	No	No	NA	3.3	1.3	1720.0	10177.5	No	No
4,4'-DDT	Pest	50-29-3	0.10	0.013	0.2	2.7	No	No	NA	3.3	1.5	1720.0	5394.0	No	No
delta-BHC	Pest	319-86-8	0.050	0.015	NA	0.51	NA	No	NA	1.7	0.53	NA	2854.8	NA	No
Dieldrin	Pest	60-57-1	0.10	0.013	4.2	0.057	No	No	NA	3.3	0.89	30.4	145.3	No	No
Endosulfan I	Pest	959-98-8	0.10	0.0080	NA	48.9	NA	No	NA	3.3	0.46	NA	46510.6	NA	No
Endosulfan II	Pest	33213-65-9	0.10	0.013	NA	146.7	NA	No	NA	3.3	0.83	NA	272438.6	NA	No
Endosulfan sulfate	Pest	1031-07-8	0.10	0.014	NA	146.7	NA	No	NA	3.3	0.96	NA	384519.5	NA	No
Endrin	Pest	72-20-8	0.10	0.019	11.0	2.0	No	No	2.0	3.3	1.1	18330.9	8686.4	No	No
Endrin aldehyde	Pest	7421-93-4	0.10	0.017	NA	7.3	NA	No	NA	3.3	1.4	NA	19373.1	NA	No
gamma-BHC (Lindane)	Pest	58-89-9	0.050	0.0070	0.052	0.2	No	No	0.2	1.7	0.73	437.2	1105.4	No	No
gamma-Chlordane	Pest	5103-74-2	5.0	0.8	NA	NA	NA	NA	NA	170	27	NA	NA	NA	NA
Heptachlor	Pest	76-44-8	0.050	0.010	0.015	0.4	No	No	0.1	1.7	0.46	108.1	127.0	No	No
Heptachlor epoxide	Pest	1024-57-3	0.050	0.0060	0.0074	0.2	No	No	0.2	1.7	0.33	53.4	236.9	No	No
Methoxychlor	Pest	72-43-5	0.50	0.078	182.5	40.0	No	No	40.0	17	7.2	305515.5	269155.7	No	No
Toxaphene	Pest	8001-35-2	0.50	0.20	0.061	3.0	Yes	No	3.0	17	12	442.2	1240.0	No	No
Aroclor-1016	PCB	12674-11-2	0.50	0.50	0.96	NA	No	NA	0.5	17	11	3933.1	NA	No	NA
Aroclor-1221	PCB	11104-28-2	0.50	0.50	0.034	NA	Yes	NA	0.5	17	17	221.9	NA	No	NA
Aroclor-1232	PCB	11141-16-5	0.50	0.34	0.034	NA	Yes	NA	0.5	17	9.6	221.9	NA	No	NA
Aroclor-1242	PCB	53469-21-9	0.50	0.16	0.034	NA	Yes	NA	0.5	17	14	221.9	NA	No	NA
Aroclor-1248	PCB	12672-29-6	0.50	0.37	0.034	NA	Yes	NA	0.5	17	13	221.9	NA	No	NA
Aroclor-1254	PCB	11097-69-1	0.50	0.17	0.034	NA	Yes	NA	0.5	17	14	221.9	NA	No	NA

Appendix I
Comparison of Quantitation Limits to EPA Region 6 Human Health MSSLs and TCEQ Tier 1 PCLs

Analyte	Data Group	CAS	AQUEOUS		EPA Region 6 MSSL	TCEQ PCL ³	EPA 6 Tap Water MDL>MSSL	TCEQ Groundwater PCL MDL>PCL	MCL ug/L	SOLID		EPA Region 6 MSSL	TCEQ PCL ³	EPA 6 Res Soil MDL>MSSL	TCEQ Res Soil MDL>PCL
			RL ug/L	MDL ug/L	Tap Water ug/l	^{GW} GW _{ING} (Res) ug/l				RL ug/kg	MDL ug/kg	Residential ug/kg	Residential ug/kg		
Aroclor-1260	PCB	11096-82-5	0.50	0.23	0.034	NA _u	Yes	NA	0.5	17	6.9	221.9	NA _u	No	NA
2,4-D	Herb	94-75-7	1.5	0.80	365.0	70.0	No	No	70.0	33	13	686067.4	368695.6	No	No
2,4-DB	Herb	94-82-6	2.0	1.9	292.0	195.5	No	No	NA	66	54	488824.8	532522.8	No	No
Dalapon	Herb	75-99-0	1.0	1.0	1095.0	200.0	No	No	200.0	33	23	1833092.9	1996960.5	No	No
Dicamba	Herb	1918-00-9	0.20	0.080	1095.0	733.3	No	No	NA	6.6	5.0	1833092.9	626188.4	No	No
Dichloroprop	Herb	120-36-5	1.0	0.51	NA	244.4	NA	No	NA	33	8.9	NA	665653.5	NA	No
Dinoseb	Herb	88-85-7	0.20	0.090	36.5	7.0	No	No	7.0	6.6	4.3	61103.1	66565.3	No	No
MCPA	Herb	94-74-6	50	NA	18.3	12.2	NA	NA	NA	170	NA	30551.5	33282.7	NA	NA
MCPP	Herb	93-65-2	50	NA	36.5	24.4	NA	NA	NA	170	NA	61103.1	66565.3	NA	NA
Pentachlorophenol	Herb	87-86-5	0.050	0.040	0.56	1.0	No	No	1.0	1.7	0.99	2979.0	2417.2	No	No
2,4,5-T	Herb	93-76-5	0.20	0.12	365.0	244.4	No	No	NA	6.6	3.3	611031.0	484786.7	No	No
2,4,5-TP (Silvex)	Herb	93-72-1	0.20	0.15	292.0	50.0	No	No	NA	13	12	488824.8	511998.2	No	No
Aluminum	Metals	7429-90-5	200	55.3	36500.0	2444.2	No	No	NA	200	25.6	76187910.2	6521159.1	No	No
Antimony	Metals	7440-36-0	5.0	1.8	14.6	6.0	No	No	6.0	10	5.1	31285.7	14956.4	No	No
Arsenic	Metals	7440-38-2	5.0	2.7	0.045 _p	10.0	Yes	No	10.0	10	1.7	389.6 _p	24167.6	No	No
Barium	Metals	7440-39-3	200	3.0	7300.0	2000.0	No	No	2000.0	200	2.6	15642262.8	7840506.7	No	No
Beryllium	Metals	7440-41-7	5.0	0.06	73.0	4.0	No	No	4.0	5	0.2	154374.2	37564.5	No	No
Cadmium	Metals	7440-43-9	4.0	0.24	18.3	5.0	No	No	5.0	5	0.3	38985.0	52421.1	No	No
Calcium	Metals	7440-70-2	5000	134.89	NA	NA	NA	NA	NA	5000	73.3	NA	NA	NA	NA
Chromium	Metals	7440-47-3	10	1.82	109.5 _q	100.0	No	No	100.0	10	0.9	210675.4	23053938.4	No	No
Cobalt	Metals	7440-48-4	50	0.99	730.0	1466.5	No	No	NA	50	0.8	902894.7	3826931.3	No	No
Copper	Metals	7440-50-8	25	1.42	1355.7	1300.0	No	No	Action level=1300 ^v	25	5.4	2905102.0	547595.9	No	No
Iron	Metals	7439-89-6	100	18.97	25550.0	NA	No	NA	NA	100	40.5	54750000.0	NA	No	NA
Lead	Metals	7439-92-1	3	0.7	15.0	15.0	No	No	Action level=15 ^v	10	1.2	400000.0	500000.0	No	No
Magnesium	Metals	7439-95-4	5000	16.8	NA	NA	NA	NA	NA	5000	61.5	NA	NA	NA	NA
Manganese	Metals	7439-96-5	15	7.68	1703.1	1148.8	No	No	NA	15	9.6	3239292.4	3409514.7	No	No
Mercury	Metals	7439-97-6	NA	NA	0.63	2.0	NA	NA	2.0	NA	NA	NA	2087.2	NA	NA
Nickel	Metals	7440-02-0	40	1.0	730.0	488.8	No	No	NA	40	1.4	1564285.7	832104.3	No	No
Potassium	Metals	7440-09-7	5000	125.2	NA	NA	NA	NA	NA	5000	169.5	NA	NA	NA	NA
Selenium	Metals	7782-49-2	5	3.2	182.5	50.0	No	No	50.0	10	2.7	391071.4	307705.4	No	No
Silver	Metals	7440-22-4	10	0.5	182.5	122.2	No	No	NA	10	1.0	391071.4	94838.3	No	No
Sodium	Metals	7440-23-5	5000	292	NA	NA	NA	NA	NA	5000	51.8	NA	NA	NA	NA
Thallium	Metals	7440-28-0	10	1.5	2.9 _r	2.0 _r	No	No	2.0	20	5.3	6257.1 _r	6313.2 _r	No	No
Vanadium	Metals	7440-62-2	50	0.4	182.5	171.1	No	No	NA	50	1.1	391071.4	291014.3	No	No
Zinc	Metals	7440-66-6	20	7.5	10950.0	7332.6	No	No	NA	20	6.2	23464285.7	9921473.9	No	No
Hex Chrom	Wet Chem	18540-29-9	10	4	109.5	100.0	No	No	100	2	2	30096.5	121916.8667	No	No

¹ Organics waters analyzed using EPA SW-846 methods; Inorganics based on ICP-AES using EPA SW-846 methods.

² Organics Soils analyzed EPA SW-846 methods; Inorganics based on ICP-AES using EPA SW-846 methods.

³ Residential groundwater and soil (30 acre source) TCEQ Tier 1 PCLs were obtained from TRRP PCL tables dated May 24, 2007.

- a. Used 1,3-dichloropropene as a surrogate chemical.

b. Used xylenes as a surrogate chemical.

c. Used 1,2,4-trichlorobenzene as a surrogate chemical.

d. Used 2-chloropropane as a surrogate chemical.

e. Used 4-nitrophenol as a surrogate chemical.

f. Used naphthalene as a surrogate chemical.

g. Used acenaphthene as a surrogate chemical.

h. Used 2-nitroaniline as a surrogate chemical.

i. Used anthracene as a surrogate chemical.

j. Used pyrene as a surrogate chemical.
- k. Used alpha-hexachlorocyclohexane (alpha-HCH) as a surrogate chemical.

l. Used endosulfan as a surrogate chemical.

m. Used endrin as a surrogate chemical.

n. Used chlordane as a surrogate chemical.

o. Used Aroclor 1254 as a surrogate chemical.

p. Based on arsenic cancer endpoint.

q. Based on chromium VI. A tap water value for total chromium was not available.

r. Used thallium chloride as a surrogate chemical.

s. Used xylenes total as a surrogate chemical.

t. Used gamma-chlordane as a surrogate chemical.

u. Used Total PCBs as a surrogate chemical.

v. Regulated by a Treatment Technique that requires systems to control the corrosiveness of their water.
If more than 10% of tap water samples exceed the action level, water systems must take additional steps.

EPA SW-846 = EPA Solid waste methods SW-846

MDL = Method Detection Limit

RL = Reporting Limit.

MSSL = EPA Region 6 Media-Specific Screening Concentrations. Revised 05/04/07.

PCL = Protective Concentration Level

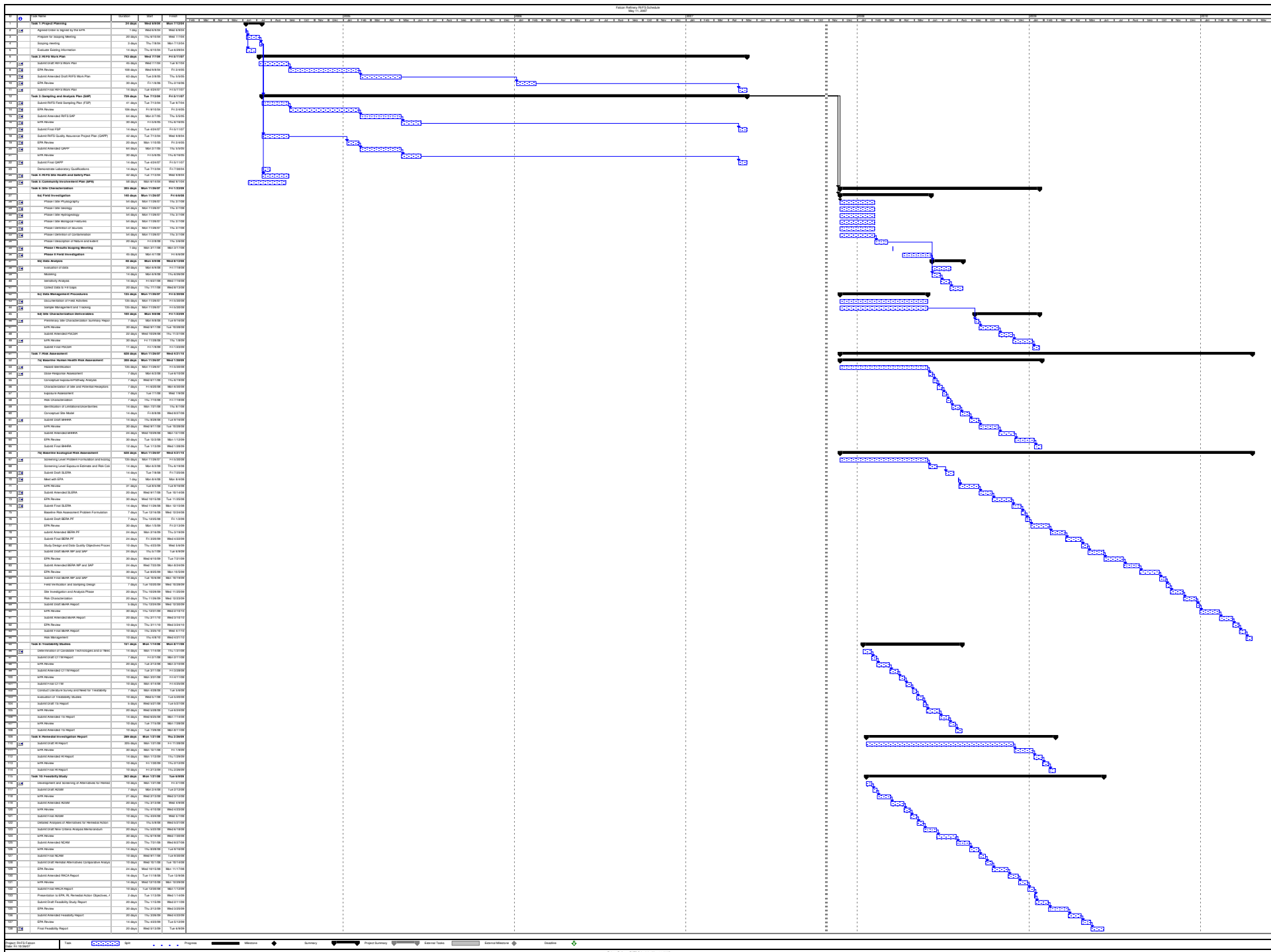
Res = Residential

TBD = To Be Determined

TCEQ = Texas Commission on Environmental Quality

MCL=Maximum Contaminant Level

APPENDIX J



APPENDIX K

REFERENCES

The predominant source of information is the first reference in this section. Following that reference are the 81 references by number as they appear in the Hazard Ranking System (HRS) Documentation Record. After the 81 references of the HRS the references are grouped into topics and the references are alphabetical and then chronological.

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